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ABSTRACT

This dissertation examines various characteristics of 79 Iowa public high schools reporting success or failure in the use of flexible modular scheduling (FMS), based on questionnaire responses. FMS schools were defined as having a daily schedule of more than 14 modules and using either variable class times, large group, small group, or independent study patterns of instruction. Principals completed a questionnaire addressing nine characteristics of FMS and soliciting school information. The following tendencies were found more often in successful FMS schools: higher percentages of graduates going on to postsecondary programs; design or modification of facilities for FMS; emphasis on inservice staff training; community involvement before FMS adoption; modification of teaching methodology; independent study considered an important part of the program; decreased classroom discipline problems and a smaller increase in discipline problems outside the classroom; modification of ongoing FMS program; when evaluated, slightly higher student achievement; slightly more spending for supplemental resource materials. The major adjustment successful schools made was a reduction of unstructured student time. Both groups generally agreed on the main advantages and disadvantages of FMS, citing students' misuse of unstructured time as the chief disadvantage. Recommendations are offered for FMS implementation and for further study. (MJL)

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A STUDY OF THE SUCCESSES AND FAILURES OF FLEXIBLE MODULAR SCHEDULING IN SELECTED SCHOOLS IN THE STATE OF IOWA

By Roger R. Ohde

EA 016 147

ABSTRACT

A STUDY OF THE SUCCESSES AND FAILURES OF FLEXIBLE MODULAR SCHEDULING IN SELECTED SCHOOLS IN THE STATE OF IOWA

By

Roger R. Ohde

B.S.C., State University of Iowa, 1959

M.A., State University of Iowa, 1962

Ed.S., Drake University, 1970

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A Dissertation Submitted in Partial Fulfillment
of The Requirements for the Degree of
Doctor of Philosophy

WALDEN UNIVERSITY
July 1977

ABSTRACT

The purpose of this study was to examine the varied characteristics of Iowa public high schools that had experienced success or failure with flexible modular scheduling (FMS).

Of Iowa's 450 public high schools in 1975-1976, 90 indicated involvement with FMS. In order to be defined as an FMS school within this study, the school must have had variable class times, some facets of large group, small group, laboratory or independent study patterns of instruction, and a daily schedule of more than fourteen modules. Eleven of the 90 schools were eliminated for various reasons.

The 33 high schools that were continuing to utilize an FMS program during the 1976-1977 school year constituted the successful schools and the 45 high schools that abandoned FMS constituted the unsuccessful schools.

Within the limitations of this study, the major conclusions were:

1. Schools that had forty-five per cent or more of their graduates going on to institutions of higher learning were more successful with FMS. Schools with less than thirty per cent of their

graduates going on for advanced study were seldom successful.

2. Schools that designed facilities for an FMS program were successful.
3. Schools that placed a great deal of emphasis on the in-service training of staff in FMS were successful.
4. Schools that involved the community in the examination of FMS prior to its adoption were generally successful.
5. Schools that modified teaching technique and methodology for FMS were more successful.
6. Schools that considered independent study as an important component of the program were more successful.
7. Discipline problems increased "outside" of classrooms in both successful and unsuccessful FMS schools.
8. Student inability to utilize independent study, free, or unscheduled time in a constructive manner was the major disadvantage of FMS.
9. The major adjustment made by successful FMS schools was to reduce the amount of unstructured student time.

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CHAPTER I

INTRODUCTION

American Society has changed considerably since the 1900's. This is especially true in education as one observes the comprehensive high school educational program with its multi-media methodology. However, the high school daily schedule that guided one's grandparents through the school day in the early 1900's is virtually the same schedule that guides a majority of today's youth through their school day in the 1970's.

Many writers in the field of education espouse the importance of a school's daily schedule. Murphy stated, "the master schedule is to the principal what the musical score is to the concert director" (18:1). Wiley and Bishop stated:

> The master schedule is the foundation of the secondary school. As goes the master schedule, so goes the school, and hence, the enhancement or the lessening of the effectiveness of the educational program (28:7).

With such importance tied to the school's daily master schedule, it was difficult to conceive that the same six, seven, or eight period day prevalent in the

early 1900's was still considered valid by a majority of the high schools in the United States in the 1970's.

A school's daily master schedule being divided into an equal number of periods per day had its beginning in the late 1800's. This structure came about as a result of the colleges' demands for uniformity in high school programs. The colleges wanted high school graduates to have similar educational backgrounds. In 1893, the "Committee of Ten" stated, "Every subject which is taught in all secondary schools should be taught in the same way and to the same extent to every pupil so long as he pursues it" (14:87).

The Carnegie Foundation, in 1909, defined the term "Unit" of credit. The definition was then adopted by the College Entrance Board. A majority of the accrediting associations across the nation followed in line. The high schools were virtually forced to adopt this standard of educational measurement of accomplishment, particularly, since they sought to have graduates accepted into the colleges and universities.

The Carnegie Unit has been responsible for the development of the concept in high schools that a given subject should be pursued by each pupil for a minimum number of minutes per day, days per week, and weeks per year. The length of the school year was to have been

thirty-six to forty weeks, a period from forty to sixty minutes, and a subject was to be studied for four or five periods a week (69:3). In spite of the fact that learning theories and programs have changed from time to time, the traditional framework of a school's daily schedule with a six, seven, or eight period day has permeated schools for almost three quarters of a century.

Debates from the 1930's through the 1960's centered on such topics as to whether or not a fifty-five minute period was superior to a forty-five minute period. It was in the late 1950's when the National Association of Secondary School Principals (NASSP) established the "Commission on the Experimental Study of the Utilization of the Staff of the Secondary School" to seek solutions to the problem of improving education. The commission, headed by Trump, began to focus serious attention on the organization of the school day.

The commission developed a type of school structure known as flexible modular scheduling (FMS). This new concept suggested that total changes be made in a school's traditional daily schedule. The concept that every subject had to fit a standard period was not accepted. The commission determined that each subject did have unique time and instructional needs. The school's daily schedule should serve the needs of the subject, teacher, and students. It had generally been the reverse.

A group's class size should be dependent upon its purpose. Examples of this strategy included the introduction of large group instruction for lectures, small group sessions for discussion, and independent study for individualized learning. A very vital part of the program was to have been the independent study phase. The purpose of this facet of FMS was to individualize the educational program to fit the needs, interests, and abilities of each student. Resource centers were introduced where students could learn on their own. The use of team teaching and teacher aides were also products of this new design.

The new design was highly acclaimed and the experimental schools were termed "the lighthouses of American education." The number of schools involved in FMS grew from seven or eight in 1961, to twenty-seven in 1963-1964. Cawelti's study in 1967, indicated that over 1100 schools were in the program. He also stated in his findings that "Very few schools abandon flexible scheduling once it has been fully implemented" (35:70).

Swaab stated in 1974:

> Flexible modular scheduling is one of the most significant and rapidly spreading educational innovations since the high school became the cornerstone of American secondary education at the turn of the 20th century. . . . Today, it is estimated that well over 2000 public and private secondary schools in the country are using this form of

scheduling. Each year the number of schools moving to the adoption of this schedule increases significantly (23:9).

In 1976, the author conducted a statewide survey of the scheduling practices currently being utilized in all 465 public high schools in the State of Iowa (*). The seven-period day continued to dominate the Iowa high school organizational structure as it had for the past fifty years. The author also determined whether or not the schools had ever utilized FMS. The results of that survey indicated that ninety Iowa public high schools had, at one time or another, experimented with some facets of FMS. This survey information was cross referenced with data obtained from the Iowa Department of Public Instruction, Westinghouse Learning Corporation, the University of Iowa, and the author's personal knowledge. However, the survey data indicated only thirty-eight of those schools remained on FMS during the 1975-1976 school year. The results of that survey indicated quite clearly that FMS was no longer one of Iowa's most rapidly growing educational innovations. If the number of schools that were unsuccessful with FMS in Iowa provides an indicator of what has happened nationally, FMS may no longer be a viable educational scheduling alternative.

* Note: The survey is significant, even though conducted by the author, because of its relevance to this study. See Appendix A for instrument used and results.

Purpose of the Study

The purpose of this study was to examine the varied characteristics of Iowa high schools who have had success or failure with FMS. Successful schools were defined as those schools who continued in FMS, whereas unsuccessful schools were defined as schools who dropped FMS. A questionnaire was developed to determine why some schools met with success while others failed. Key areas of FMS were selected to determine if the emphasis given by successful and unsuccessful schools was a factor.

The study focused on the following questions:

1. To what extent were the facilities housing the program designed for FMS?
2. To what extent and in what manner did the staff receive and continue to have in-service training on FMS?
3. To what extent was the community, other than the Board of Education, involved in the examination of FMS prior to its adoption in the system?
4. To what extent were the over-all courses of study modified after the adoption of FMS?
5. To what extent was independent study adopted as part of the FMS program?
6. To what extent did student discipline problems change under FMS?

7. To what extent was the FMS program revised after being formally implemented?
8. To what extent did the evaluation of FMS indicate a change in student achievement?
9. To what extent was the amount and quality of resource materials used in classrooms and resource centers changed with the implementation of FMS?

Hypotheses

The following hypotheses were tested:

1. The schools that modified or designed facilities for FMS programs were more likely to be successful.
2. The schools that spent and continued to spend time with the "in-service training" of staff were more likely to be successful.
3. Schools that involved the community in the examination of FMS were more likely to be successful.
4. The schools that modified their educational programs to a greater degree were more likely to be successful.
5. Schools that spent more emphasis on independent study were more likely to be successful.
6. Unsuccessful schools experienced a greater increase in discipline problems than the successful schools.
7. The successful schools modified their original FMS programs more than the unsuccessful schools.
8. Academic achievement was higher in successful schools.

9. Schools that added to the quantity and quality of the materials in classrooms and resource centers were more likely to succeed than those schools who made no changes.

A questionnaire was developed on a "Likert Scale" that sought to determine whether or not successful or unsuccessful schools fell into one of five cells or combination of cells that differed in emphasis. The study encompassed the entire population and involved experienced replies. Any findings that differed would prove significant. The study was designed to determine if successful schools placed emphasis on areas that differed from schools that were unsuccessful.

Definition of Terms

A listing of the terms that needed to be defined for the purpose of this study included both general terms and computer-related scheduling terms.

Course: A course is a particular subject into which students register.

Course design or course structure: A course design or course structure is a description of how the course is to meet. Such a description includes information about the number of phases and the periods (modules) per meeting of each phase.

Cycle: Cycle refers to the number of days the schedule runs before it repeats itself.

Daily schedule or master schedule: A daily schedule or master schedule is a chart or general plan of action by which the different activities of the curriculum

involving pupils, teachers, and other school personnel are accorded a sequence and locations. It specifies when each class will meet and for how long, who the teacher is, and in what room the student is to report.

Flexible modular scheduling (FMS): Flexible modular scheduling is an arrangement of periods scheduled in modules of time, such as 15, 20, 25, or 30 minutes. The basic modules are no less than 10 but no more than 30 minutes. Subjects that require a great deal of time are scheduled in multiple modules. It is also called flexible scheduling, modular scheduling, or variable scheduling. It typically includes large group/small group instructional patterns with an independent study phase and frequently includes team teaching. For purposes of this study a school day must have included more than 14 modules in order to be termed as a FMS school.

Module: A module is a period of time within the scheduled day. It is a unit of time ranging from ten to thirty minutes in length.

Phase: A phase is an element of course structure or design.

Senior high school: Senior high school refers to any three-or-four-year school encompassing grades nine through twelve.

Singleton: A singleton is a term used to describe a course or a course-phase which has only one section.

Traditional schedule: A traditional schedule is an organization of instruction which contains six to eight periods per day with each period typically being the same length. The composition of a class is generally the same from day-to-day. The schedule with few exceptions, is the same from day-to-day. The exceptions could include physical education, vocal and instrumental music classes.

Limitations

This study was limited to those Iowa high schools that had at one time or another utilized FMS.

The survey was limited to Iowa public high school administrators, counselors or experienced teachers who were directly involved with FMS.

Assumptions

The schools that were studied were determined by the results of the author's Iowa pilot survey. It was necessary to assume that each superintendent of the public schools in Iowa responded accurately to that survey. The superintendents determined whether or not high schools in his or her school district had experimented, at one time or another, with any facet of FMS. It was assumed that the superintendent would indicate "yes" if his school district had utilized any facet of an FMS program.

It was assumed that the questionnaire was, indeed, completed by someone within the school system experienced in FMS.

The Significance of the Study

A school's master schedule provides the direction for both students and teachers throughout the school day and throughout the school year. FMS was an attempt to provide a new approach to teaching methodology and a new way of organizing the school day.

Educators, especially administrators, need to know more about what has been tried successfully, as

well as what has been tried unsuccessfully, by those schools that already have had a background in FMS. This study represents one of the most comprehensive examinations of the successes and failures of FMS in Iowa. A large number of the FMS studies that were conducted throughout the United States were done within a single school system. A majority of the FMS studies involved a sampling of from two to twenty-two schools. The author's study included all public high schools in Iowa that utilized an FMS program.

The study determined those areas of strengths and weaknesses of FMS. As principals consider the design of future master schedules, they need the knowledge that certain ideas have been tested and proven while other ideas have failed. Principals constantly need to be searching for better ways of organizing the school day. The results of this study have provided principals with the knowledge of why some FMS schedules succeeded while others failed. This knowledge may help principals as they develop new approaches in the construction of a school's master schedule.

As principals study and evaluate new approaches to improvements in school schedules, results of this study provides additional data upon which they might draw. These data provided high school principals information on several facets of FMS that could allow

them to either improve upon what is presently being done, or, may even help them to generate new dimensions in school scheduling.

This study provided an indication as to whether or not the educational modifications made through FMS were significant in the public high schools of Iowa. This study suggested that a new format or structure of the school day had evolved. The future direction of a school's daily schedule may demand an organizational structure even more flexible than that of FMS.

The "humanism" movement that began in the late 1960's was just beginning to take hold in the 1970's. Several states, such as Iowa, adopted school laws mandating the teaching of "humanism."

Fantini explained the movement:

> Variously identified as human potential, personal growth, affective, nonverbal humanities . . . this movement now in high gear, places priority on the individual and his largely underdeveloped inner world (40:400).

Fantini critized a majority of school solutions for the "humanization" of schools. He envisioned the movement to include giving students, teachers, and parents greater choice in selecting the kind of education they want (40:402).

Recent learning theory has clearly pointed out that youngsters learn in many ways and that each younster has his own unique best way. Thus, if true individualization is to take place, a school's master schedule would

have to become even more refined than that proposed by Trump years ago.

FMS was originally designed to provide some of the types of choices and alternatives being described. In order to personalize and humanize the educational program, a school's daily schedule must truly allow for such individualization. Future implications for many new and varied educational programs could hinge on the success or failure of FMS.

The characteristics of successful FMS schools provided important data for future direction in the construction of school facilities. As architects design educational facilities of the future, they too need to be aware of the types of programs and daily master schedules needed in the year 2000. Will the educational programs and schedule designs resemble those of the 1900's, or, will there be new designs? The design of FMS may only be a stepping stone to a new and evolving program.

The daily schedule has provided the framework for the instructional pattern and overall philosophy of the school. It is indeed important to take a look at what has happened in those school systems where FMS has failed, and, where it has succeeded. An analysis of this data may provide new direction for the schedule builders of this country and for the designers of our school facilities.

Trends outlined in two major studies appeared to be no longer valid, at least in Iowa. Swaab's study indicated that the number of schools continuing to consider FMS as a viable scheduling alternative was increasing yearly. This trend was found to have reached its peak in Iowa. Cawelti's study indicated that once schools implemented an FMS program, they seldom abandoned it. This trend was not true in Iowa.

This study has provided up-to-date information on the status of FMS in Iowa as a viable scheduling alternative to the traditional six, seven, or eight period school day. The information that was obtained from all public high schools in Iowa has substantiated many previous studies and has contradicted others.

CHAPTER II

LITERATURE REVIEW

Introduction

The purpose of this chapter is to give an overview of the development of the structure of high school daily schedules from the late 1800's through the development of the flexible modular scheduling (FMS) concept as it existed in the 1970's. The chapter is divided into several sub-headings that provide the reader with an understanding of the significant aspects of the study.

The introduction defines the daily schedule and its role in the school system. The second section of this chapter covers the historical development of scheduling practices from the late 1800's through the 1960's. Chapter II also includes the influences and research that helped to structure daily schedules of high schools in the United States. After tracing the historical development of the scheduling process, the author, because of its basic importance to this study, details the concepts of FMS. Another section is devoted to the computer and its significant role in the

development of FMS. That section also provides the reader with an insight into the computer's capabilities in the scheduling process.

Another section reviews the advantages and disadvantages of FMS, as was determined by the "pilot" schools and others who had pioneered in the field. The author examines a number of studies that provide research information on all facets of FMS. Implications for the future of FMS are explored in the concluding pages of this chapter.

Historical Development of the Structure of High School Daily Schedules

A review, by the author, of ten books selected at random from hundreds in the field of school administration, made little or no mention of the need for societal institutions to have some form of organization. Books in the field of school administration clearly covered the organizational decisions that must be made; however, little or no time was spent justifying the organizational process. It was assumed that society understands that schools will have some form of organization designed to coordinate the social responsibility of educating youth.

As stated by Bent:

> Society expects that the activities of the school will be confined within limits which are usually described indefinitely, but, which are nonetheless understood. Within those limits, certain specific objectives are sought in the development and

> education of youth. There is also an expected pattern of performance by which the high school is to seek its objectives. As for every other social institution, the high school has attached to it in the public mind characteristic sets of mores, customs, and tradition that are expected and approved (5:53).

The development of the master schedule of courses for schools has long been considered an important administrative task. Gorton stated, "The administrator's responsibility is to organize people, task, and services in a way that will facilitate or best accomplish the objectives of the school" (12:105). It has usually been the principal of the school who was assigned the responsibility of completing a school's master schedule.

The complexities of actually constructing a school's daily schedule were generally only appreciated by those persons who actually performed the task. The Dictionary of Education defined the daily program, or schedule as "A chart or general plan of action by which the different activities of the curriculum involving pupils, teachers, and other school personnel are accorded a sequence and location" (11:311).

The definition, itself, does not convey all the implications of what a school schedule is and does. Anderson described what a school schedule should show and included the following:

1. Names of school, locations, and administrative heads.
2. Dates operative.

3. Organization of the school day and week, including times for opening and closing, the number and length of class periods, the time between classes, the lunch hour, and provisions for homeroom and activity periods.
4. Names of all teachers, courses and sections to which assigned conference and planning periods, and study halls if assigned.
5. Course sections/activities scheduled each period.
6. Number of room in which class meets.
7. Days of week that each class section meets.
8. Number of pupils assigned each class section.
9. Grade level of pupils enrolled in each course section.
10. Special provisions as seminars, large group sections, floating periods and block-time classes (1:152).

It is a complex task to develop a school's master schedule in such a way that as many student course requests as possible are honored. McIssac reported that:

> The number of possible master schedules for a school with a conventional schedule where every day of the week is the same is the number of periods in the school day raised to the power of the number of sections to be scheduled (46:17).

The resistance to making a change in a school's schedule became two-fold; first, it was complicated to alter and required a great deal of work to change, and, secondly, any changes made, affected the entire system. Hence, the review concentrated on literature that described the structure of a senior high school's daily schedule, and, the factors that affected that structure.

Despite constant and continuing changes in the educational program, the basic overall design of senior high school schedules changed little from the beginning

of the century. High school programs evolved from the narrow college-oriented curriculum of the early 1800's to the comprehensive educational systems of the 1970's.

Eliot, one of the early scholars in the field of education, did a considerable amount of writing and speaking while serving as President of Harvard University in the late 1800's. In 1892, Eliot was appointed to serve as Chairman of a National Council of Education Committee called "The Committee of Ten." The "Committee of Ten" met at Columbia University in New York City in November of 1893. This committee was supported in part by the National Education Association (NEA). The report of the Committee provided a great deal of influence and direction on the educational programs and structure of the secondary schools of the United States for many years.

In preparation for that meeting, the "Committee of Ten" was provided daily schedules and curriculum information of the forty leading secondary schools from various parts of the country. This information had been collected and compiled prior to the meeting.

The "Committee of Ten" made mention of this report in their findings in which it was stated:

> This table proved conclusively, first, that the total number of subjects taught in these secondary schools was nearly forty, thirteen of which were found in only a few schools; secondly that many of these subjects were taught for such

> short periods that little training could be derived from them; and thirdly, that the time allotted to the same subject in the different schools varied widely (14:85).

A profound statement made by the Committee was as follows:

> The Committee of Ten unanimously . . . declare that every subject which is taught at all in secondary schools should be taught in the same way and to the same extent to every pupil so long as he pursues it, no matter what the probable destination of the pupil may be (14:87).

In construction of sample programs, the Committee had adopted twenty as the maximum number of weekly periods, but with two qualifications: namely, that at least five of the twenty periods should be given to unprepared work, and laboratory subjects should have double periods whenever that prolongation should be possible (14:94).

Thus, several facets of a school's daily schedule were clearly fixed prior to the 1900's. These included: the pattern of daily classes Monday through Friday, the taking of at least four subjects, the standardized method by which courses were to be taught, and the recognition that laboratory classes should be allotted more time.

Prior to the 1900's, the early years of high school development in the United States, many different time and structure scheduling practices were being utilized. One senior high school had been offering

English for one hour five days a week; another had been offering the same subject one hour three days per week and still others a different pattern. Students from high schools had been coming together at the college level with a tremendous variance in background. The Carnegie Unit of course credit became the method of standardization.

According to Tompkins:

> There were numerous inquiries into school-college articulation that called attention to serious problems involved in improving college admission policies, for example, the Report of the Committee of Ten (1891-1894); the Report of NEA Committee on College Entrance Requirements (1895-1899); the annual reports of the College Entrance Examination Board (1900-1910); and the reports published by regional, State, and university accrediting agencies (69:1).

The definition and adoption of the Carnegie Unit as a measure of high school work occurred in 1909; it had an almost immediate effect on education at both college and high school levels. Within a short time after 1909, practically all high schools measured their work in terms of the "Unit" as had been defined by the Carnegie Foundation and approved by the College Entrance Board. The action of the regional accrediting association in approving the Unit encouraged its wide adoption. As further stated by Tompkins, "As the college adopted it as a measure, it forced it upon the high schools" (69:3).

The specification for the four-year high school by the Carnegie Foundation appeared to have been the fact that it was the customary type of secondary organization in the first decade of this country (69:3). Since 1909, the basic means of measuring the progress of pupils from high school entrance to graduation had been the Carnegie Unit.

More specifically, as stated by Tompkins:

> The Carnegie Unit has been responsible for developing in the high schools the concept that a given subject should be pursued by each pupil for a minimum number of minutes per day, days per week, and weeks per year. The assumption is that a pupil must attend classes in each subject for a minimum of 120 clock hours per school year, or the equivalent, to earn one Carnegie Unit, and must carry a program of four subjects for each of the years to be graduated.
>
> It used the four year high school basis and assumed: (1) that the length of the school year was thirty-six to forty weeks, (2) that a period was from forty to sixty minutes long, (3) that a subject was studied for four or five periods a week (69:3).

The establishment of the "Unit" as an educational measure did help to solve several problems of that time. Specifically, it helped to:

1. Overcome the confusion regarding the admission requirements to college.
2. Overcome the confusion regarding time allotments of subject matter in secondary schools.
3. Overcome confusion regarding the function and scope of the high school, including,
4. preparation of students for college, and

5. finally, it helped to develop continuity in the school system.

Literature references, on what constituted the proper number of minutes per educational period in a school's academic day, dated back to a 1933-1934 study done in a high school in Mount Vernon, New York. In this study, Stewart compared the results of class instructional periods of 110 minutes, and 80 minutes, to those obtained in their typical instructional pattern of 40 minute periods. The longer periods were used over fewer weeks so that the total amount of class time was comparable. In this particular experiment, the eighty-minute periods were preferred by the teachers and provided the best results in achievement (87:155-157).

A study in 1933 involved thirty-two Iowa schools that were evaluated on the basis of achievement-test results. The Iowa study again found superior performance in longer periods (37:284:289). The comparison in this study was between five of the longer periods (55 to 60 minutes) to seven of the shorter ones (40 to 45 minutes).

The information in the 1940's, regarding high school daily schedules, closely substantiated the research of the 1930's. In 1944, the Educational Policies Commission proposed to extend the school day to allow for seven fifty-five minute periods. It was also suggested that certain courses be extended for

more than one period at least part of the school year (10:151). A similar recommendation was made in a United States Office of Education pamphlet relating to the small high school (63:4).

In 1946, Mort espoused changing the concept of the "Committee of Ten" that all schools and all subjects follow uniform patterns. He detested the forces that mandated state requirements that set forth so many minutes a week or so many minutes per day to be used for specific purposes (17:228). Mort recognized a need for change in the methodology of teaching. He also gave hint to what was later called "large group instruction" when he stated:

> Similar standards on class size have doubtless had a great deal to do with the slowness of experimentation with large class units in the use of such media of communication as the sound film and radio transcription (17:229).

Most of the writings of the early 1950's pertained to schools who were experimenting with schedules which featured such things as the Rockland (Idaho) public School's three-hour period in the morning, and, four short periods in the afternoon (43:516-517). This particular reference was selected as a forerunner of variable time frames for different classes, even if in a very rudimentary manner. Other scheduling experimentation involved "block" periods of time, and "floating" activity periods.

Conant attracted attention, in 1959, with his study of the American high school. He was politely critical of several shortcomings in American secondary education. This was the period following "Sputnik" and the fear that our educational systems were falling behind.

Conant studied the American high schools and made many recommendations:

> The school day should be organized so that there are at least six periods in addition to the required physical education . . . A seven or eight period day may be organized with periods as short as forty-five minutes. Under such an organization laboratory periods as well as industrial arts courses should involve double periods (8:64-65).

The recommendations of Conant and those of the "Committee of Ten" were somewhat similar. However, Conant indicated a dislike for the six period day when he stated:

> With a six-period day, one period which is taken up by physical education, the academically talented student cannot elect the wide academic program recommended and at the same time elect art, music, and practical courses (8:65).

Conant's statement was indicative of the push of the late 1950's to provide better programs for the academically talented student. That student, according to Conant, should have been taking more courses in a broader curriculum base (8:65). Thus, at this point, Conant had recommended expanding the curriculum to a broader base, and, expected the academically talented

student to take more courses. Both of these recommendations became a part of the base of FMS concept that was being developed at the same time by the National Association of Secondary School Principals.

The length of a school day was found to have varied from one state to another. A majority of the states had enacted laws requiring schools to conduct classes for a minimum of five to six clock hours daily. According to a study by Starges, the model length of a school day in the Midwest was about seven clock hours including lunch time (86:50). The North Central Association of Colleges and Secondary Schools, an accrediting agency, has had an affect upon school schedules. This association required their members to provide a school day of at least six hours exclusive of lunch periods, and, also detailed out the number of minutes per week that must be offered in particular subject areas to meet standards for membership (20:22).

In 1960, Sparks studied twenty Iowa high schools to determine whether or not a relationship existed between the length of period utilized by high schools, and, a students growth in mathematics. He found the median length of class periods in the high achievement schools was fifty-four minutes, compared to forty-seven minutes in the low achievement schools (84:154-155).

In a Missouri study in 1956, Mowrer found no significant differences in achievement in English for

students graduated from schools with periods of fifty minutes or more and of students from schools using periods of less than fifty minutes. The students were matched in ability (78:143).

In 1963, Anderson and Van Dyke stated:

> That the evidence and arguments tend to favor a schedule with six or seven long periods of fifty-five minutes or more over one with eight or nine short periods of forty-five minutes or less. Any advantages for short periods in terms of reduced costs appear to be more than affected by more reasonable teaching loads and teacher satisfaction with longer periods. Since the evidence available indicates no significant differences in student achievement, we believe that teacher preferences should prevail (1:156).

A recent writing by Wiley suggested that each subject encompass a sovereign framework of underlying generalizations and relationships which would lend insight into that subject. As stated by Wiley:

> As subjects differ, best ways of teaching them and learning them must differ. The modern science curricula, PSSC physics, BSCS biology, and CBA chemistry, stress the laboratory or discovery approach to teaching. Inherent in this approach is the requirement of long blocks of time to conduct and meticulously observe worth-while experiments. One period of 100 to 120 minutes is preferable to a shorter period of time. . . . Foreign language instruction using audi-langual methodology cannot be carried on with its true intent in the fifty minute period. Optimal approaches have indicated the need for perhaps forty minutes (at a maximum) for classroom work, combined with longer and shorter times spent in the laboratory (28:12-13).

The writings of the early 1970's generally do not dwell on the length of periods within the school day but seem to cover the methodology used within that

period. The cry for individualized instruction was somewhat silenced by the "back to basics" movement permeating the United States in the mid 1970's.

Instructional methods changed a great deal since the early 1960's. Studies clearly indicated that students learn best by a variety of methods. According to Dunn:

> Instruction occurs through a variety of methods and is not directly related to the organizational pattern. . . . Individualization, which is a basic instructional approach, may be used successfully in every organizational pattern but is more easily introduced when differentiated staff patterns (teachers, assistants, paraprofessionals, student-teachers, parents, older students, resource persons, etc.) and extensive media are available (9:51).

The Beginning of Flexible Modular Scheduling

Mort, in the late 1940's recognized a need to break the pattern of uniform daily class offerings. He recommended that large group instructional patterns be used for such things as audio-visual presentations (17:229). However, very few authors in the 1940's or early 1950's wrote in contradiction of the lock-step system of scheduling.

It was in the late 1950's, that two groups, the Catskill Area Project in Small School Design, and, the National Association of Secondary School Principal's Study Commission, both operating independently of each other, and within overlapping periods of time, came to some of the same conclusions on needed revisions

of a school's daily schedule, program and teaching methodology.

In the late 1950's, two factors helped to make our country take a more critical look at American education. The first factor was Russia's launching of "Sputnik." An alarm went up throughout this country that our science and mathematics programs were inadequate. New programs in science were developed and included: Physical Science Study Committee (PSSC) in physics, CHEM study in chemistry, and Biological Science Study Committee (BSSC) in biology. These programs were funded by grants from the National Science Foundation and the Federal government. They were examples of the new and difficult laboratory and manual approaches to teaching the sciences. The modern math programs that were prevalent in the 1960's and into the 1970's were also developed during this period of time.

A second factor was the critical shortage of teachers that existed in the late 1950's. This shortage was projected to continue for several years, forcing schools to take a different look at more effective ways of both improving programs and utilizing staff. Morse stated:

> According to estimates of the United States Office of Education . . . schooling is handicapped by a shortage of 200,000 teachers and 132,000 classrooms. Compounding the problem, about 11% of the teachers leave their profession each year (16:1-6).

The "Catskill Area Project in Small School Design" was established in 1957, and, financed by a grant from the Ford Fund for the Advancement of Education. This program involved twenty-two central schools in New York's upper Catskill Mountain region. These schools were searching for theory and techniques that would improve the variety and quality of education in rural secondary schools.

Many of the findings of this project had ramifications in changing the patterns of teaching methodology at the senior high level. Several excerpts of the Catskill Project will be reviewed as they related to the early ideas on flexible modular scheduling. The author divided the concepts into six categories:

1. Improvement of individualized instruction:

> Yet . . . in many small high schools, girls and boys in small groups in the same room at the same time with the same teacher study different subjects. Good teachers have been teaching such classes for years - "multiple classes" they call them. . . . What were teachers comments - 'My students went faster on their own . . . I spent less time selecting problems for the students to do because this becomes their responsibility.' Tape recordings prepared in advance by the teacher, guide two groups while a teacher works at a blackboard with a third group. Some prepare more extensive "Learner's Guides." These work sheets and Learner's Guides spell out study objectives and goals and contain specific directions for using textbooks, workbooks, laboratory manuals, and other learning materials. . . . Teachers and librarians cooperate for more fruitful use of library resources by students . . . They chose films, filmstrips, and recordings

that students may use in groups or on their own and these all become a part of the parcel of work (59:7-8).

2. Correspondence courses:

   One way to provide students with an enriched program is to use supervised correspondence courses to augment regular courses (59:9).

3. Flexible schedules:

   a. Small schools endeavor to increase the variety of learning opportunities by adopting eight or nine period days which tend to spread the talents of small staffs over more subject matter fields. There is a need to provide more flexibility in the instructional program of small high schools. Flexibility demands new designs for master schedules.
   (Note: The use of new designs is later used by Bush & Allen in their book "A New Design for High School Education.")

   b. Emerging in some small schools are:
      (1) Longer periods scheduled four times a week instead of five.
      (2) Rotating periods that give each class more opportunity to meet at optimum learning times of the day.
      (3) Morning, afternoon schedules that are interchanged every two weeks.
      (4) Two or more master schedules that can be exchanged at will (59:10-11).

4. Use of the computer:

   Perhaps an electronic computer could provide the schedule variables needed for a given instructional program geared to the needs of individuals and small groups. The computer should be able to build such a schedule where a principal could not (59:11).

5. Use of teacher aides:

   More time for teachers, more time for students to plan, more time for teachers to help individual students, more time for teachers to keep in touch with parents . . . by taking over study halls, making and running off materials (59:14-15).

6. Use of electronic communications:

> Audio-visual equipment, such as tape recorders, films, filmstrips, radio and television were used for instructional purposes. . . . Recordings, some "Tailor-made" by the teacher on tape, some commercially-prepared discs, multiply the teacher's teaching time, and enable the student to proceed at his own best learning pace . . . (59:19).

The concept of an even more "flexible" schedule was dominant in this work. This project "dreamed" of a time when the activities of the day simply dictated the schedule with a new schedule that could be produced on demand.

Independent study was given top preference as a means of individualizing instruction with what was later called "learning packets."

The variable time periods for different classes were not developed to any extensive degree. This group may have felt that until computer help became available, such scheduling practices wouldn't be feasible. They did, however, spell out the need for computer assistance to accomplish the scheduling needs.

In 1956, the National Association of Secondary School Principals established a commission to seek solutions to the problems of improving education despite an acute shortage of teachers that existed at that time. "Shortage" is underlined to emphasize a condition of the time that was a major consideration

in their deliberations. This commission, for more than four years, studied and worked with the results of nearly twenty-seven experimental junior and senior high schools across the United States. Financial support came from the Fund for Advancement of Education and the Ford Foundation. The results of the commission's study were published in Guide to Better Schools: Focus on Change by Trump and Baynham in 1961 (26).

An hour-long movie, "And No Bells Ring," released in 1960 by the National Association of Secondary School Principals (NASSP), met with heavy demand all over the United States. In addition, commission members and staff wrote many articles, gave numerous talks, and conducted workshops in virtually every part of the United States. The publicity surrounding this "New Design" brought almost instant acclaim to the experimental schools, as "lighthouses" in American education.

FMS evolved from the work of this commission. Major revisions in school programs were recommended by this commission. Their recommendations ranged from a total restructuring of the school day from the time honored six, seven, or eight period master schedule, to a general overhaul of the teaching-learning process.

It is important that the reader understand the full scope and sequence of flexible modular scheduling

in that there were many major modifications called for by Trump in the book Guide to Better Schools: Focus on Change. The general categories as they effected teachers, students, facilities, and the schools' daily schedule were as follows:

1. Classes were to be "flexible" with phases of all inter-related instructional patterns. These phases were to include:
   a. Small group classes of fifteen or fewer pupils especially for small group discussion.
   b. Independent study is to be emphasized. It will provide for differences in individual interests and abilities, study in depth, and help a student to develop the ability to go it alone.
   c. Some classes will be larger with 100 to 150 students or more. Their purpose will be to hear a lecture, view a film, or other such type of presentation to introduce units, explain works, demonstrate, summarize or give tests.
2. Teacher assistants will be used:
   a. Full professionalization of teaching - others will do the clerical, and housekeeping, and supervision chores.
   b. Teachers will call upon community consultants to provide special information. The teachers will not be the single source of information.
3. Educational facilities will reflect the change:
   a. Tomorrow's school will use government buildings, stores, offices, and industrial establishments for independent study.
   b. Resource centers and library facilities will provide for use of television, radio, disc recordings, video and audio tape recordings, films and slides.
   c. Large group instructional centers will call for auditoriums capable of being divided into large group rooms. Many smaller classrooms and different kinds of spaces for independent study.

d. Large libraries with seating space for one-fourth to one-third of the student body as students will be in class less time.
e. Laboratory spaces or resource centers will be provided for all subject areas.

4. Schedules will be more flexible:

a. The school day will be divided into fifteen to twenty minute modules of time, instead of equal periods, with no standard intermissions.
b. Individual schedules will be worked out by electronic devices and will show where each student is at all times every day.
c. Changes in schedules will be made whenever counselors and teachers feel it wise.
d. Students will be scheduled in class groups an average of only eighteen hours a week. The average student will spend about twelve of the eighteen hours in large-group instruction and six in small-group discussion.
e. Students will spend an average of twelve hours each week in school in individual independent study.

5. Students' individual differences will be recognized:

Fundamental blocks of content should be acquired - rules of grammar, simple mathematics, history, and the facts of science. In the process of learning, it is the level of "inquiry" that individual differences will be allowed greater freedom of action.

6. Teachers' individual differences will also be recognized:

a. Team teaching in which each teacher will utilize his strengths.
b. Differentiated assignments and work loads will be given to those most qualified.
c. Salary differentials will be made for those handling a greater share of the leadership.

7. Evaluation will be more complete:

a. More teacher time will be spent in improving evaluation instruments for students.

b. Immediate self-appraisal type programs for the individual can be constructed.
c. Achievement tests will continue. Records, scales, and inventories will also be used to indicate whether or not the student is developing the skills of independent study, problem solving, the ability to do creative work, and, competence in social relationships.
d. Any changes in the student's pattern of development will be carefully observed, and, if need be, his program of instruction varied to keep his growth and development in correlation with the school's educational goals.
e. Total school accomplishments will be reassured.
f. Are all students achieving its aims and do all students practice intellectual inquiry in depth to maximum individual capabilities?
g. Teaching will be evaluated to see if a high standard of scholarship is being maintained. Do teachers consider the changes desirable?
h. Are the changes being recommended financially feasible on the basis of anticipated results (26:23-59)?

Several of the members of both the Catskill Project and the NASSP Commission were principals in pilot schools of both projects. These people began experimentation in the late 1950's and early 1960's with some of the concepts that had been earmarked by either the Catskill Project or the NASSP Commission. Modifications in teaching methodology included team teaching, large group/small group and independent study class phases. FMS was to be introduced in only three schools and in a very limited basis.

The concept of the "New Design" was made and developed. It became known as modular scheduling, flexible modular scheduling, or variable scheduling.

All were used interchangeably to basically describe the new design in education.

The Computer's Role in Flexible Modular Scheduling

Among recommendations made in Guide to Better Schools: Focus on Change were suggestions for varying the length of times per week a particular class might meet, varying the size of the group for any particular meeting, and in general providing flexibility in scheduling arrangements to facilitate different-sized classes at appropriate times (26).

Bush stated that:

> An alleged main obstacle to adoption of many suggestions for improving high school education is "the schedule." For example, the most frequently cited reason for failure to incorporate proposals made by a committee in Images of the Future is that "they can't be scheduled" (32:205).

Trump's plan called for a schedule far more complicated than the conventional "5 x 7" (5 days, 7 periods) being used at the time in the majority of the nations's secondary schools (2:143). The implication was that to implement the suggestions made by Trump, the school day would need to be split into many shorter periods or modules so that the length of a particular class period could be varied by changing the number of consecutive modules it was to meet (7:24-25). This concept, coupled with the idea that sometimes

classes could be as large as one-hundred or more, or as small as five to ten and that sometimes teams of teachers needed to be scheduled together with groups of students, raised the cry that the theory was fine but not workable. Scheduling this maze would have been practically impossible.

Developing such a schedule would, indeed, be an extremely complex task. Petrequin, an administrator in an early flexible scheduled school stated:

> In a modular schedule, the combination of these factors (teachers, students, time, facilities, and course designs) are in the millions. A computer is therefore, obviously necessary in order to investigate the myriad of possible combinations it can do in a few seconds, to produce the best program considering each students' many course requirements (66:31-32).

Oakford, the industrial engineer who designed the original Stanford School Scheduling System, had a unique analogy:

> The computer logic required for flexible scheduling is more complicated than that used by the Air Force to track the altitude, speed, and direction of every airplane flying over the United States at any given time (29:220).

In the fall of 1961, Educational Facilities Laboratories and International Business Machines Corporation (IBM) provided support for a project supervised by the Massachusetts Institute of Technology (MIT) to write a computer program to assist in the construction of master schedules or timetables for

educational institutions. Successes achieved during the first year of the completed project, using college data, warranted additional grants by the above organizations to three high schools (Wayland High School in Wayland, Massachusetts; Ridgewood High School in Norridge, Illinois, and Cohasset High School in Cohasset, Massachusetts); so that these schools could, on an experimental basis, utilize the computer programs and personnel associated with the MIT project in the construction of their schedules for the school year 1963-1964. In the spring of 1963, a grant from the Educational Facilities Laboratories permitted Wayland, Norridge, and Cohasset to apply Generalized Academic Simulation Program (GASP) to the task of building the master schedule and programming students. Computer time was made available to the project by the IBM Corporation.

There were two major computer "programs" that actually constructed the master schedule for the school in addition to loading students into classes and producing student schedules. Those were the GASP and the Stanford School Scheduling System (S^4). An examination of most other computer programs of that time revealed that they did not construct the master schedule for the school, but rather were dependent upon someone in the school to construct the master schedule. Many

computer centers utilize one of the two original programs to construct master schedules for schools. Westinghouse Learning Corporation is an example, from the private sector, of a corporation providing scheduling services to schools.

The first application of GASP to secondary school scheduling proved very satisfying. Through the years, it was modified and rewritten as new, and more capable computers were introduced. GASP and S^4 continued to be employed by school districts that were capable of supplying the expertise of a scheduling person, who was competent of interacting with the computer, to construct a master schedule reflecting the requirements of a school's staff (18:1-18).

Scheduling services are as readily available as the proximity of a computer. Computer services, however, were not problem free. The early writers in the field were principals who had been building their school schedules manually. The advent of the computer was a blessing for them compared to the manual chore of piecing together a flexible modular schedule. Most of the early experimental schools tackled bits and pieces of the many concepts of FMS. Gard stated that the computer "spews out a minimum conflict schedule with students neatly placed and classes balanced - perhaps as much as 95 per cent complete" (42:425).

Two studies on the success of the computer in building the school's daily schedule did not indicate that this area had been free of problems. Smolek's study in 1973, indicated that for sixty-nine computer built schedules by Westinghouse Learning Corporation in 1972-1973, 31.1 per cent of students had partial schedules. Smolek also pointed out that each schedule conflict, however, wasn't as serious because it may only occur one day and one module of a cycle. In a traditional schedule, the conflict would have been daily (83:106-107).

A study by Rens indicated that a large number of course conflicts, ranging from sixteen to sixty-six per cent, and that a problem of balancing a student's class load from day to day existed within the schedule (81:74). "The goal of increasing the number of courses was reached but resulted in a large number of singletons causing conflicts of scheduling" (81:122). The findings of Rens were also supported by Wiley and Bishop who pointed out that a broad elective program that provided for a more individualized curriculum did have scheduling limitations (28:103).

Rens also found that schools utilizing FMS whose students elected a higher number of courses also had more student conflicts in their schedule (81:140). Increasing the curricular offerings and allowing students to take more classes were both goals of the

FMS program. However, in the process of accomplishing these goals, more students had partial schedules and class conflicts.

The advancement of knowledge in the computer sciences has grown considerably since its first entry into the field of school master schedule construction back in 1961. Computer constructed master schedules, other than those in the original pilot programs of the GASP and S^4 systems, have been available to schools since 1965.

The complexities of scheduling were increased when educational programs were expanded and the number of subjects taken by students were increased regardless of whether or not the daily schedule was traditional or modular. The major hurdle, however, had been crossed. The technology needed to construct a FMS was available. Whether or not the FMS program merits the effort was yet to be determined.

The Advantages and Disadvantages of Flexible Modular Scheduling

September 1976 marked the thirteenth year of a computer generated FMS program in American senior high schools. The FMS approach has moved forward the search for an individualized educational program for students. It made an attempt to break the traditional lock-step schedule by allowing independent study,

varying lengths of class periods, and significant alternatives in class size.

In this part of the chapter, the reader is exposed to the advantages and disadvantages of FMS. A total of twenty-seven pilot schools were involved in various facets of the new design for education in 1961. It was interesting to note that several of the pilot school principals did doctoral dissertations on the implementation of FMS in their school districts. Two principals, Wiley and Bishop, later teamed in writing books on various facets of the new design.

What were the comments made by the people who implemented the early schedules? Howard, principal at Ridgewood High School in Norridge, Illinois, implemented FMS in that system in September 1960 (one of the original three in the nation). The Ridgewood schedule in 1963-1964, became the first school in the country to have a computer built schedule (44:209). All classes were organized on four phases of instruction that included (1) large group, (2) discussion groups, (3) learning laboratories, and (4) individual study. Each teacher team determined the appropriate time allotments for each of the phases desired for each course in the program.

The schedule had limited flexibility. The schedule, once set, was not changed during the year. It was constructed, however, so that students and

teachers had a limited number of options regarding their free time. The students then scheduled themselves into one of several areas.

Howard further described the Ridgewood program:

> Every effort is being made at Ridgewood to provide the school's most highly motivated and most mature students with a maximum of unscheduled time . . . On the average, freshman find themselves with 15 to 20% of the day unscheduled, while seniors find themselves with 25 to 30% of their day unscheduled. Likewise, students in high ability groups are given, on the average, more unscheduled time than are students in lower ability groups (44:210).

The Ridgewood daily schedule incorporated twenty (twenty-minute) modules. No bells rang. Each student and teacher had three different daily schedules; one for Monday and Thursday, another for Tuesday and Friday, and a third for Wednesday. There were various blocks of time for different classes and classes met on different days.

Howard saw the advantages as:

> Giving the faculty the opportunity to have the say on such vital matters as the size of the learning group, the length of time certain groups should meet, who should be available to instruct the group, and the physical or psychological environment made available to the group for a specific learning task (44:208).

These were decisions that he previously had made with little input from the faculty.

Having been one of the first schools in the nation to have a computer built schedule is worthy of Howard's comment.

Howard stated:

> The greatest advantage to the school of a computer-built modular schedule is that the scheduler, in the process of generating his master schedule, is able to construct a large number of preliminary schedules. He can analyze each schedule and then incorporate improvements in each succeeding schedule until such time as the best possible combination of courses, time allocations, teachers, and rooms within the scope the school has indicated (44:213).

Howard indicated that after the sixth year of operation utilizing a modular schedule, a number of problems had been solved only partially and a number of questions had not yet been answered. Howard saw independent study the major benefit of FMS (44:213).

Speckhard, in 1967, reported on several measures used to evaluate FMS in the pilot schools of Colorado (51:301-308). In this study, a control school was measured against an experimental school in the same school system. The basic characteristics of both schools and students were similar. No significant differences were recorded on the basis of the Iowa Tests of Educational Development (ITED). An analysis of the Watson-Glaser test indicated that the experimental school students had developed a significantly higher ability in critical thinking. Speckhard's findings indicated that FMS will work well with all students. Speckhard singled out supervised study time and students not utilizing this time effectively as one of the disadvantages (51:307).

Polos, principal at the Claremont High School in Claremont, California in 1969, described the advantages and disadvantages of their program in greater detail than most writers in the field. For this reason, his entire listing of advantages and disadvantages was utilized as each is of definite interest as a basis for further study.

Advantages of Claremont's program:

1. They were able to individualize their program.
2. It did open up time for teacher preparation and planning.
3. It did enable them to provide a more varied curriculum.
4. Their guidance program improved.
5. They learned to be flexible and did change programs.
6. They found time tailored to a particular curriculum did improve instruction.
7. Students better used facilities such as libraries and resource centers.
8. They did offer new programs on independent study.
9. Students did more school work at school.
10. Some students took as many as eight or nine courses.
11. Made better use of community resources.
12. They incorporated team teaching into system.
13. They expanded programs for both the gifted and for the below average and slow learners.

The disadvantages found were:

1. Some students lacked initiative and did not use independent study time wisely. This was part of their education.
2. Resource and independent study facilities needed to be expanded. They weren't prepared for the large number of students in independent study.
3. They had to "slay the dragon" of reprehensibility, i.e., reassuring the community that all educational shortcomings were not due to flexible scheduling, but were genuine problems that belonged to modern education in general. The public was inclined to blame all problems on the flexible schedule.

4. They had to change the system of attendance since accountability became more complex. In time, it was solved.
5. It brought about traffic pattern problems and a burden on certain facilities at certain times.
6. The improper balance on students daily schedule with too little class time on some days and too much on others was a problem for some students (49:315-319).

The articles by principals in the early FMS schools were representative of the many writings of the late 1960's and early 1970's when FMS was a "hot" item.

Evans, in a 1968 study of nine FMS schools in Oregon, found that independent study programs were successful to the degree that the objectives were understood by the teachers and students and to the degree that the independent study time was structured. The structuring of independent study involved the teacher giving assistance in the selection of the problem and providing guidance throughout the time of the study. It was found that students most often became confused and unproductive when they had little or no guidance in their work (61).

Cawelti, in a 1968 study of twenty-two high schools across the country, reported that many schools adopted FMS and initiated the innovative features which that type of scheduling permits; but the basic approach to teaching remained unchanged. Essentially, the same types of activities were done in different lengths of time. Cawelti stated in part, " . . . most schools have made a mere start in developing the

self-instructive curriculum materials needed when one suddenly turns students loose" (34:60). He also reported that a significantly greater proportion of students in schools having FMS felt there was less regimentation in the school than did students in control schools. The students felt that they had better opportunities to explore things themselves. However, Cawelti found no significant difference in the way in which they viewed actual attendance in scheduled classes (34:60-63).

Evaluation of achievement in schools having FMS consistently indicated that the students do at least as well as students in other schools. Speckhard found that, overall, students did as well on all measures of achievement and critical thinking as the control school. The experimental group performed better than the control group on some areas of the ITED's, namely Social Studies, Use of Sources of Information, and Correctness and Appropriateness of Expression (68). Keim reported that on all measures of the Metropolitan Achievement Tests, students performed as well as or better than they did before FMS was introduced into the two high schools of the district. Students' performance in reading was especially improved (65:1). The students at the Delavan-Darien High School (Wisconsin) showed gains on the Iowa Tests of Educational

Development "which were greater than the majority of the schools composing each of the norm groups (70:39).

Murman's study, in 1972, of the FMS program at Hastings, Nebraska, clearly indicated that gains made in achievement test scores under FMS were equal to or better than those under a traditional program (79:128). Murman's study found FMS equally effective in achieving academic growth with both below average students and above average students as was formerly recorded under their traditional program (79:128).

The evidence gathered by Murman supported the modular program over the traditional program. However, like any other single program, the modular program did not meet the needs of all people.

Murman stated:

> Special kinds of courses and activities such as mini-courses, uniform program of teaching students how to study, work-release programs, tutorial activities, individual progress program, buddy system, and student assistant program, should be initiated to meet the needs of more individual students. Time structures for students and courses should continually be reviewed and studied in relation to individual needs of students.
>
> Teacher availability is essential to the program. Schedules should be developed and communication established between teachers and students so that each may know where and when the other is available.
>
> An ongoing orientation program is important to the success of the program. New students, parents, and teachers must be acquainted with the modular program. Returning students, parents, and teachers must be reminded of the things the modular program can or cannot do for the educational program (79:129).

Research on attitudes has shown that students reacted favorably to FMS and to unstructured time in particular. In a rather unique study at Abington, Pennsylvania, it was shown by Glathorn that students preferred the program at the North Campus School which they attended in grades nine and ten to that of the South Campus School which they attended in grades eleven and twelve. The North Campus School had FMS; the South Campus had a traditional schedule (64:1).

Other studies were done in science, mathematics, English, physical education and vocational courses. In almost all instances, the students in FMS fared as well or better. In a majority of the studies, student preferences were in favor of modular scheduling.

Was there anything in the literature highly negative to FMS? Very few articles were published where the author stated very frankly, "It won't work!" There were articles, however, where the author recognized that problems did exist. Fish stated, "that the student without an academic sense of purpose 'goofs off' and causes problems by his increased visibility unless special provisions are made" (41:64).

Swatt cautioned business teachers to not apply the varying length and frequency of periods to beginning courses in shorthand and typewriting. Courses that demand maintenance and continuity in skill development

as an important factor in building skills needed to meet daily (53:349).

School Management, in its May 1967 issue, pointed out the problem of not having proper facilities to house a flexible modular schedule. There was a problem of not having enough classrooms which were flexible enough to house small group and large group instructional patterns. An additional problem involved inadequate instructional materials centers able to provide for the independent and individualized study aspects of a good FMS program (50:104).

Gard cautioned that the freedom of flexible scheduling had a very definite price. He listed as problems: the students slipping off campus, absenteeism, vandalism, and petty theft. According to Gard, these problems "skyrocket" (42:428).

The premise of absenteeism increasing was in direct contradiction with the very early studies where absenteeism either declined or remained stable. Gard also stated that schools who have experimented successfully (schools still using FMS in early 1970's), "reveal that about twenty-five per cent of the students are eventually placed under full-time supervision" (42:428). Wiley covered the same topic when he stated:

> Parents must also realize that this program is intentionally designed to allow students some leisure time during the school day, thereby giving students an opportunity to interact with peers,

> teachers, and other school officials in a more casual, unstructured school climate. This school climate might frequently resemble that of a college campus with students coming and going to various classes, resource facilities, labs., library, or lounge areas in a more casual free manner (28:148).

In 1970, McClure studied nineteen secondary schools involved in FMS to determine if the principals of those schools had encountered common problems and if they employed similar solution strategies. In this study, McClure identified more than 175 FMS problems. He reduced that number to forty general problem statements. Some of his major findings included:

> Administrators in the selected schools did not perceive many of the problems identified in the related literature as representing major problems in the administration of flexible class schedules. Eighteen common FMS problem statements and six common recommended solutions were identified. . . . The four problems most frequently identified as common in the administration of flexible class schedules were (a) additional demands placed upon administrators, (b) increased perplexities in pupil accounting, (c) inefficient use of unscheduled time by students, and (d) scheduling difficulties (76:144).

McClure found the most common solution strategies to problems to be (a) reliance on homeroom periods (b) teaching the team members (c) guidance departments that worked closely with students, and (d) setting of deadlines on when class and individual work assignments were due (76:144-146).

McClure, in his conclusion, recommended that a study be conducted to determine why some secondary schools have discontinued FMS. McClure's findings

corresponded closely to the study by Beggs in 1965 (71:110-114).

Thomson, superintendent of the Evanston Township High School in Evanston, Illinois, stated in an article written in 1971 that there were many adjustments made in the FMS program at that school (54:484). He pointed out that student attitude and achievement were positive and that both students and teachers liked the program. Students were making wide use of library and laboratory facilities. Students were scoring high on tests of critical thinking. He also detected an increase in staff creativity. According to Thomson, students found learning was more than sitting in a classroom. Thomson further stated that "students in the modular schools generally make a greater percentage of both high grades and low grades than do students in traditional schools where the 'average' grade is dominant" (54:484).

However, Thomson clearly pointed out that all is not well with FMS. It appeared that some students did not fare well. A study, completed within the Evanston system, by Walden found:

> Those who achieved poorly under a traditional class schedule tend to achieve even more poorly under the modular schedule. . . . When given free selection time, this group of students invariably choose activities of a purely social or antisocial venture. They tend to waste time. Opportunities for independent study are ignored even when the student enjoys the freedom of selecting the area of exploration. . . . Those retrogressed students are an identifiable group, tending to score poorly

on achievement tests and on the responsibility and social maturity scales of the California Psychological Inventory (54:485).

The findings of Walden in this study were contradictory to the findings of Speckhard in 1968 (68) and of Murman in 1972 (79).

Wiley stated, "The student during independent study may seek out teachers, either in their classrooms or office area, for conferences or individualized help (28:149).

It was apparent throughout the readings that independent study was not synonymous with individualization of instruction. As pointed out by Thomson, "the benefits of individualization do not automatically arise from free time" (54:485). He suggested that it took careful design of instructional strategies and that meant considerable structure for some students and modest structure for others.

Did school systems make adjustments knowing that independent study time was causing concern in many FMS schools across the United States? In Evanston High, the immature students had been assigned to study halls during unscheduled time. The results were not favorable as students resented what they considered to be intrusions upon their personal freedom. The correction made in Evanston involved expanding the number of reading classes and the scheduling of students

with weak reading skills into these classes for part of their "free" time (54:485).

Hopkins High School in Hopkins, Minnesota, another school district actively involved in FMS, made a bold move to correct problems similar to those described at the Evanston school. Hopkins developed a special school within the school to help the low-achievers, or, what they termed "an uncommitted learner" (54:485).

The early writings contained a great deal concerning the necessity of having from forty to fifty per cent independent study time. Later writings also discussed independent study time but in a very prescriptive manner.

Swaab stated:

> The school administration and faculty must be prepared to modify their patterns of working with students to accomodate the new program with its unstructured time. In fact, the success or failure of the program will hinge on the ability of the school personnel to mobilize their resources to create an effective out-of-class school experience (23:112-113).

In general, the evaluations have shown teacher, student, and parental approval, extensive cooperative activity on the part of participating faculty members, wider and more effective use of audio-visual procedures, and good behavioral and social adjustment on the part of the student. Few significant differences in academic achievement for students in the experimental classes and control classes were reported by most of the schools.

The two major problem areas appeared to be a lack of adequate facilities, and student misuse of independent study time. How serious were these problems? Were adjustments possible? These areas appeared to be in need of further study.

Lawrence, in 1969, compared a total of ten schools from five states that were in FMS. He classified those ten schools into three categories: those having success in FMS, those having difficulty but still in FMS, and schools who have abandoned FMS. This study was limited to include a sample of ten teachers, twenty students, and ten parents per school. Lawrence relied upon personal observation for much of his data.

His findings included:

1. The change agent most often responsible for initiating FMS in successful schools was the principal. Teachers initiative is unsuccessful.
2. More attention and greater effort was made to adapt the curriculum to a FMS program in successful schools.
3. A greater effort made to evaluate FMS in successful schools.
4. Greater expansion of curricular offerings was found in schools in the program compared to those that have dropped.
5. Quantitative facts such as pupil-teacher ratios, per pupil cost and experience of principal did not differentiate between successful and unsuccessful programs.
6. All schools in his study used large group, small group, independent study and ranked small group instruction as most effective, independent study second, and large group last.
7. Two-thirds of all students in all groups believe that the flexible program results in better student morale.

8. The major weakness of the FMS as reported by principals, teachers, students, and parents is the inability of students to make good use of unstructured or independent study time (75:238-242).

The study by Lawrence involved only ten total schools with three schools in two categories and four schools in the third category. However, his findings were in line with the stated advantages and disadvantages listed by most authors.

Implications for the Future

What are the implications for the future direction of high school scheduling practices? Will schools continue to provide a fixed period framework for the educational program, or will they go the direction of FMS?

In 1963-1964, twenty-seven schools in the United States were experimenting with some form of FMS. In a 1967 study, Cawelti reported that the national rate of schools that had adopted FMS was 14.8 per cent or an estimated 1100 schools. He also indicated that an assessment, by Indiana University, found less than one-half this number used a modular schedule when described as follows: a variable schedule with modules of five to twenty minutes and organizes the day into various combinations of these modules (35:70-71). Cawelti felt that if he used the Indiana University

interpretation, that a five to seven per cent adoption rate was a more accurate estimate. According to his study, "Very few schools abandon flexible scheduling once it has been fully implemented" (35:70).

Cawelti did find a high abandonment rate for some innovations, "such as certain new science and math curriculums, televisions, programmed instruction and team teaching" (35:70).

The National Seminar on Modular Flexible Scheduling held at Racine, Wisconsin in 1968, stated in their report:

> The flexible scheduling movement in the United States today has arrived at a plateau. The technical problems, by and large, have been solved, but enormous problems remain. Currently, widespread adoption of flexible modular scheduling is being impeded by:
>
> 1. a lack of capable consultant help to secondary schools
> 2. limited accessibility of computers to many schools
> 3. the expense involved in implementing such a schedule
> 4. a lack of trained administrative leaders, the prevalence of rigid, obsolete physical plants, and
> 5. widespread relectance on the part of professional educators, community leaders, and
> 6. boards of education to adopt a comparatively new practice which affects an entire school program (62:13).

Swaab stated in 1974:

> Flexible Modular Scheduling is one of the most significant and rapidly spreading educational innovations since the high school became the cornerstone of American secondary education at the turn of the 20th century. . . . Today, it is estimated that well over 2000 public and private

> secondary schools in the country are using this form of scheduling. Each year the number of schools moving to the adoption of this schedule increases significantly (23:9).

In the spring of 1976, the author conducted a survey of the scheduling practices used in Iowa's public high schools during the 1975-1976 school year. That same survey asked whether or not high schools had ever utilized some form of FMS. The results of that Iowa survey contradicted previous studies. The results of the author's 1976 survey indicated that ninety Iowa public high schools had, at one time or another, experimented with FMS. However, only thirty-eight of those schools remained on FMS during the 1975-1976 school year (exhibit A).

Summary

The purpose of this chapter was to review the literature and research related to FMS. It was necessary to select representative writings and studies as several were duplications of what had already been covered. This review followed the historical development and some of the processes that brought about the present status and structure of a high school's daily schedule.

Whether "each" subject of the curriculum, should, in fact, receive the same or similar time allotments did not appear to be documented by research. The evidence was clear, that for early teaching methodologies,

the longer periods of time were more favorable. However, it was unclear as to whether or not the teaching methodologies utilized in the 1970's justified a daily schedule different from the structure which had its original beginning in the late 1800's.

There were contradictions in the literature. Exactly how many schools began FMS and in what year? Thomson stated that five schools were the pioneering institutions in 1963, and he listed them (54:484). In an article by Howard, he stated three, and, he listed those schools (44). Technically, both authors were correct. Changes in high school scheduling practices were occurring on both the east and west coasts, as well as throughout the United States. The fact that no one know exactly who, where, and to what extent FMS was developing was not surprising.

The use of terminology was also of interest. A very basic term to this study, "flexible modular schedule," is referred to by Howard as a modular schedule and by Polos as a flexible schedule (44, 49). These terms were used interchangeably throughout the literature. In fact, Good defined flexible modular scheduling with all three terms used interchangeably (11).

The more serious contradictions in the literature were those that described the advantages and disadvantages of FMS. A preponderance of literature was found

espousing the many virtues of FMS and of its increasing use in the schools of the United States. However, there were few writers in the field who described problems with FMS. It was found that there were definite problems with student scheduling even though computer assisted and computer built.

Early research established that FMS was at least equal to traditional approaches in evaluating the academic achievement of all students. However, a later study established that students who were not academically talented, had greater problems with FMS.

Research provided little help in determining whether FMS was better than a traditional schedule. A large number of the proponents of FMS justified their support based upon empirical observation and student opinionnaires rather than upon academic achievement of the students in the program. A majority of the studies comparing academic achievement reported that it was equal to a traditional schedule. It may be possible that this innovation of the 1960's was adopted, by reportedly thousands of schools, without having ever proven its merit. The author's 1976 survey of scheduling practices in Iowa indicated a high fatality rate in the number of schools that ventured into FMS and had later abandoned it.

The silence in the literature since 1972 on FMS was over-whelming. What happened to FMS? Can or

should FMS be considered as a viable scheduling alternative for the high schools of Iowa or the United States?

CHAPTER III

METHODOLOGY

The study was designed to examine varied characteristics of Iowa public high schools that have had success or failure with FMS. Successful schools were defined as those schools that continued in FMS, whereas unsuccessful schools were defined as schools that dropped FMS.

Specifically, the investigation focused attention on the following questions:

1. To what extent were the facilities housing the program designed for FMS?
2. To what extent and in what manner did the staff receive and continue to have in-service training in FMS?
3. To what extent was the community, other than the Board of Education, involved in the examination of FMS prior to its adoption in the system?
4. To what extent were the over-all courses of study modified after the adoption of FMS?
5. To what extent was independent study adopted as a part of the FMS program?

6. To what extent did student discipline problems change under FMS?
7. To what extent was the FMS program revised after being formally implemented?
8. To what extent did the evaluation of FMS indicate a change in student achievement?
9. To what extent was the amount and quality of supplemental resource materials changed with the implementation of FMS?

Research Procedures

During the 1975-1976 school year, Iowa had a total of 450 public school districts. Each school district had one or more high schools. The author contacted all 450 schools by letter (appendix A) and asked each superintendent to complete a questionnaire concerning the high school's current scheduling practices. The results of that survey (appendix B) provided the basis for this study.

Those schools whose superintendents indicated that their public high schools had at one time or another utilized FMS constituted the total population to be studied. To help verify the statewide survey, the author obtained listings of FMS schools from the Iowa Department of Public Instruction; University of Iowa, Iowa City, Iowa; Area 11 Computer Center, Des Moines, Iowa; Westinghouse

Learning Corporation, Iowa City, Iowa; and from the author's personal knowledge. These sources of data verified the list of FMS schools obtained from the survey responses.

The ninety Iowa public high schools whose superintendents had indicated their involvement with FMS were contacted again by letter and asked to complete a questionnaire (appendix C).

A questionnaire was developed that covered nine varied characteristics of an FMS program. The questionnaire utilized a Likert scale to determine whether or not there were degrees of emphases between those schools that had dropped FMS, as compared with those schools that had remained on FMS.

The questionnaire was field tested by superintendents and principals in schools that had both dropped and had continued to use FMS. Assistance in the questionnaire's development was also obtained from Dr. Joseph Millard of the Research Division of Heartland Area Education Agency, Ankency, Iowa. The questionnaire was given to a total of eight different administrators (four in FMS schools and four who had dropped FMS) before it was determined that the instrument was indeed clear, concise, and complete.

The questionnaire was field tested eight times rather than the four that had been planned in the

dissertation proposal. All eight field tests were administered through a personal visitation to the school. It was found that several aspects of the questionnaire were unclear. Many excellent suggestions were made by each of the administrative respondents. After the questionnaire had been examined by the eighth school administrator, the Research Division of Heartland Area Education Agency, the research advisor, and the author, it was agreed that the questionnaire was clear, concise, and ready for mailing.

Research Sample

A total of ninety letters and questionnaires were mailed to all of those schools whose superintendents indicated, that, at one time or another, a high school in his or her district had utilized FMS. A listing of the schools and the scheduling results are found in appendix D.

The letter was addressed directly to the high school principal. The author asked that if the principal were not in the system at the time FMS was in effect at his school, he should have the questionnaire completed by an administrator, counselor, or experienced teacher who was familiar with the program. If no one in that system had experience with FMS, it was to be so stated and the questionnaire returned. Schools were provided

with a self addressed stamped envelope. A telephone number was given to the respondents who were instructed to call collect in the event that questions or instructions were not completely clear.

Responses were obtained from all ninety schools. One of the informational questions asked of the principals was how many years their schools were on some type of FMS. Seven schools indicated the information was incorrect and that their high schools had not been on FMS. Five of seven schools had made schedule modifications but the changes were not correctly described as FMS. Three additional schools were dropped because they did not meet the minimum criteria established on the definition of FMS within the study. For a school to qualify as utilizing FMS, it must have had a daily schedule composed of more than fourteen modules and utilized either variable class times, large group, small group or independent study patterns of instruction. This definition was not given initially because various terms such as flexible schedule, modular schedule, and flexible modular schedule were being used interchangeably. An additional school was dropped from the study since it had reorganized with another school district during the 1976-1977 school year.

It was necessary to call four schools to clarify their data. Two principals called collect to clarify

a question. After clearing the data, seventy-nine Iowa public high schools were determined to have utilized FMS at one time or another.

The thirty-three schools that continued to utilize FMS during the 1976-1977 school year constituted the successful schools. The forty-six schools that abandoned FMS, after utilizing it for a year or more, constituted the unsuccessful schools.

Treatment of the Data

The data were divided into sets of prediction models: one set consisted of schools that utilized FMS during the 1976-1977 school year, and a second set consisted of those schools that no longer utilized FMS. The data were scored separately on each response extracted from the questionnaire. All data were computer scored at Heartland Area Education Agency, Ankeny, Iowa.

The questionnaire was divided into three sections. The first section of the questionnaire provided data that described the schools in the study. The second part of the questionnaire included the eight categories designed for the study. The third part of the questionnaire asked for brief statements on the major advantages and disadvantages of FMS as experienced by the schools. A final question asked schools that had continued to utilize FMS to describe the most important modifications that had been made in their programs.

Because the study involved one hundred per cent of the Iowa public high schools that had utilized FMS the results were from a census of opinion rather than a sampling.

Each question of the study was examined for significance by the percentage of responses to each category given by both the successful and unsuccessful schools using FMS. These data were then presented in chapter IV in table form with a line graph depiction for visual clarity.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

This chapter contains the data that were collected from all seventy-nine schools in the study. An analysis of these data follows the statistical presentation. The presentation of the data is organized into the following sections:

1. A general description of all seventy-nine Iowa public high schools in the study who utilized FMS. The thirty-three successful schools in FMS are scored separately from the forty-six unsuccessful schools to determine if the two groups did differ in description. When descriptions did differ, comments are made to that point.
2. Each question of the study is stated in this section. Each response is also stated. The responses to each of the study questions are tabulated for both the successful and the unsuccessful FMS schools. Line graphs have been used for greater clarity. An analysis that describes the degree of differences between the responses to each question follows the data.

3. A third section includes a listing of the responses that were given to the short answer completion section of the study. A descriptive analysis follows that section.

The schools within the study were not identified but scored as either a successful school (one that was still utilizing an FMS program in 1976-1977) or an unsuccessful school (one that had dropped an FMS program).

There were seventy-nine total schools in the study who met the minimum definition given for an FMS program. All seventy-nine schools participated in the study. Thirty-three FMS schools were classified as successful as they continued to use the program during the 1976-1977 school year. Forty-six schools were classified as unsuccessful schools in that they dropped FMS prior to the 1976-1977 school year. Those Iowa public high schools, who had at one time or another utilized FMS are listed in exhibit D.

Section 1. General Description of Schools

The information that follows includes data on nine separate items. The first question served to separate the schools into the successful and unsuccessful schools in the study. Detail was provided on the type of daily schedule that was being utilized during the 1976-1977 school year by schools that had dropped FMS.

Three tables provide descriptive data concerning the size of the school, the mix of rural and urban clientele, and the percentage of students going on to college. Five other descriptive items deal with information concerning the schools involvement with various aspects of FMS.

The purpose of the first question was to separate the successful schools (those that were utilizing FMS during the 1976-1977 school year) from the unsuccessful schools (those that no longer utilized FMS).

1. The type of daily schedule being utilized during the 1976-1977 school year by schools in the study:

   a. Successful schools: 33 or 41.8% of the total 79 schools in the study utilized FMS.

   b. Unsuccessful schools:

8 period day	- 15	or 19.0% of the 79 schools
7 period day	- 20	or 25.3% of the 79 schools
6 period day	- 2	or 2.5% of the 79 schools
Other	- 9	or 19.6% of the 79 schools
Total	46	or 58.2% of the 79 schools

The above schools dropped FMS and were utilizing a more traditional schedule in 1976-1977.

Note: Nine "other" schools were further described as follows.

One school with a floating 8th period through a 7 period day.
Two schools with a 9 period day on a 6 day cycle.
Two schools with 14 mods on a 5 day cycle.
One school with 14 mods on a 6 day cycle.
One school with a 10 period day on a 5 day cycle.
One school with a 7 period day on a 6 day cycle, and
One school with a 5 period day alternating with a 7 period day on a 6 day cycle.

Three schools that were dropped from the study because of definition were utilizing fourteen period days on a six day cycle. Some type of modification to a traditional six, seven, or eight period day on a five day cycle was maintained by fifty-three per cent of the seventy-nine schools in the study.

The drop-out rate of forty-six FMS schools of the seventy-nine total schools in the study was just over fifty-eight per cent. The success rate in Iowa of public high schools in FMS was just under forty-two per cent.

2. Type of school district:

TABLE 1

TYPE OF SCHOOL DISTRICT

Description	Successful Schools In FMS		Unsuccessful Schools who Dropped FMS		All Schools in the Study	
All rural	5	15.1%	6	13.0%	11	13.9%
Mostly rural	12	36.4	26	56.5	38	48.0
Almost half rural	13	39.4	9	19.6	22	27.9
Mostly urban	3	9.1	4	8.7	7	8.9
All urban	0	0.0	1	2.2	1	1.3
Total	33	100.0%	46	100.0%	79	100.0%

It was noted that the schools in the study were well balanced in regard to student background. The single largest group in both categories was from schools that were classified mostly rural. There were relatively few

school districts in Iowa that would be totally classified urban. Only one public high school in Iowa was in the totally urban classification and that school was unsuccessful in FMS. A total of 10.2 per cent of the schools in the study were mostly urban to all urban. It was noted that 9.1 per cent of all the successful schools and 10.9 per cent of all the unsuccessful schools were in that category. This match-up was quite close.

The match-up on "all rural" was also quite similar. Of the total schools in the study, only 13.9 per cent could be described as totally rural. The successful schools had 15.1 per cent of their thirty-three schools in this classification, while 13 per cent of all the unsuccessful schools were found to be in the same category.

Twenty-six of forty-six unsuccessful schools or 56.5 per cent were classified "mostly rural." This one category contained more unsuccessful schools than all other groupings.

The only category where the successful schools outnumbered the unsuccessful schools was "almost half rural." This category also represented the single largest group of the successful schools. The background setting of schools in this study was unusually parallel.

3. Percentage of high school graduates who go on to two or four year colleges:

TABLE 2

THE PERCENTAGE OF GRADUATES OF SUCCESSFUL AND UNSUCCESSFUL SCHOOLS GOING ON TO INSTITUTIONS OF HIGHER LEARNING

Percentage of Graduates on to Colleges	Successful Schools In FMS		Unsuccessful Schools who Dropped FMS		All Schools in the Study	
0 - 15%	0	0.0%	1	2.2%	1	1.3%
15 - 30	2	6.1	12	26.1	14	17.7
30 - 45	8	24.2	21	45.7	29	36.7
45 - 60	17	51.5	10	21.7	27	34.2
Over 60	6	18.2	2	4.3	8	10.1
Total	33	100.0%	46	100.0%	79	100.0%

There was an obvious difference in this category between the successful and the unsuccessful schools. It was noted that only 6.1 per cent of all the successful schools had 30.0 per cent or less of their graduates going on to college, whereas 28.3 per cent of all schools who were unsuccessful with FMS fell in that same category.

In the category with over 60 per cent of graduates going on to college, the ratio was over four to one with successful schools (18.2%) as compared to unsuccessful schools (4.3%). The ratio remained quite high when including the over 45 per cent category (69.7% to 26%).

The single largest group of successful schools was found in the 45 to 60 per cent category. The largest single category for unsuccessful schools was found to be the 30 to 45 per cent group.

4. High school enrollment of schools in the study:

TABLE 3

HIGH SCHOOL ENROLLMENT OF SUCCESSFUL AND UNSUCCESSFUL HIGH SCHOOLS

High School Enrollment	Successful Schools In FMS		Unsuccessful Schools who Dropped FMS		All Schools in the Study	
Under 200	9	27.3%	17	37.0%	26	32.9%
200 - 500	15	45.5	17	37.0	32	40.5
500 - 1000	8	24.2	9	19.5	17	21.5
1000 - 2000	1	3.0	3	6.5	4	5.1
Over 2000	0	0.0	0	0.0	0	0.0
Total	33	100.0%	46	100.0%	79	100.0%

The data described the number and percentages of schools in each category including all seventy-nine schools in the study. The detailed breakdown indicated comparisons made for successful and unsuccessful FMS schools in the study.

The percentage of successful and unsuccessful schools in each enrollment classification was quite close. None of the public high schools in Iowa with enrollments over 2000 students experimented with FMS.

The percentage of the successful and the unsuccessful schools in the three enrollment categories with over 500 students was found to have had just over a one per cent difference. The successful schools had 27.2 per cent in that category while 26.1 per cent of the unsuccessful schools were in the same classification.

A comparable balance was found in the two categories under 500. A total of 72.8 per cent of the successful schools were in that category compared to 74 per cent of the unsuccessful schools in that same classification.

The balance of the schools in various enrollment classifications in the study was found to be quite similar.

5. The year FMS was implemented in the school:

TABLE 4

YEAR FMS IMPLEMENTED IN SUCCESSFUL AND UNSUCCESSFUL SCHOOLS

Year Implemented	Successful Schools In FMS		Unsuccessful Schools who Dropped FMS		All Schools In The Study	
1967 or earlier	2	6.1%	1	2.2%	3	3.8%
1968 - 1970	13	39.4	21	45.7	34	43.0
1970 - 1972	11	33.3	17	36.9	28	35.4
1972 - 1974	5	15.1	6	13.0	11	14.0
1974 or later	2	6.1	1	2.2	3	3.8
Total	33	100.0%	46	100.0%	79	100.0%

A majority of the public high schools in Iowa implemented FMS between 1968 and 1974. Only three Iowa schools implemented FMS prior to 1968 and only three schools had implemented FMS since 1974.

The percentage of successful and unsuccessful schools was found to be quite similar in the years that FMS had been implemented. It was apparent that a majority of the public high schools in Iowa had adopted FMS between 1968 and 1972.

6. The number of years the schools utilized FMS:

TABLE 5

NUMBER OF YEARS FMS UTILIZED BY SUCCESSFUL AND UNSUCCESSFUL SCHOOLS

Number of Years	In FMS		Dropped FMS	
1 or 2 years	1	3.0%	15	32.6%
3 or 4 years	3	9.1	20	43.5
5 or 6 years	13	39.4	5	10.9
7 or more years	16	48.5	6	13.0
Total	33	100.0%	46	100.0%

A close correlation existed between the year implemented and the number of years that schools utilized FMS. A majority of the FMS schools typically came into existence since 1968. This would account for the 87.9 per cent of schools still in FMS with five or more years of experience.

Many schools made the decision to drop FMS early in the experimental stage. Almost one-third of the unsuccessful FMS schools dropped the program after only one or two years. Over two-thirds of the unsuccessful schools experimented with an FMS program for three or more years.

A curious question involves why schools would drop an FMS program after seven or more years of use. An examination of the responses of those six schools to the questionnaire on the disadvantages revealed the following comments:

(1) FMS to a 9 period day on a 6 day cycle	Kids did not schedule back. Put kids back in class more. Kids were skipping school. One period of lounge maximum.
(2) FMS to a 7 period day	Less motivated students had too much free time. Increase in discipline problems.
(3) FMS to a 8 period day	Students couldn't handle free time responsibly. Discipline was bad.
(4) FMS to 14 mod variable schedule	Students could not handle all the free time. Teachers became very lazy in supervising students
(5) FMS to 7 period day	Many discipline problems during unstructured time.
(6) FMS to 7 period day on 6 day cycle	Students wasted time. Teachers not willing to do more work to make FMS successful.

7. The degree to which schools adopted the various facets of FMS:

TABLE 6

DEGREE OF ADOPTION OF VARIOUS FACETS OF FMS

Degree of Adoption	In FMS		Dropped FMS	
Adopted all facets	7	21.9%	6	13.0%
Adopted most facets	8	25.0	8	17.4
Adopted several facets	12	37.5	20	43.5
Adopted a few facets	4	12.5	10	21.7
Only minor changes	1	3.1	2	4.3
Total	32	100.0%	46	100.0%

Those schools that adopted either most or all of the various facets of FMS totaled 45.9 per cent of the successful group as compared to 30.4 per cent of the unsuccessful schools. At the other extreme, only 15.6 per cent of the successful schools adopted only few or very minor facets of FMS. It was noted that 26 per cent of the unsuccessful schools, however, made only minor to few changes in their educational programs.

Thirty of the forty-six unsuccessful schools adopted few to several facets of FMS. This compared to sixteen of thirty-two successful responding to this question.

8. The success or failure of the FMS program as viewed by participating schools:

TABLE 7

DEGREE OF SUCCESS OR FAILURE OF FMS

Degree of Success or Failure	In FMS		Dropped FMS	
Highly successful	12	37.5%	3	6.5%
Somewhat successful	17	53.1	14	30.4
Not successful or unsuccessful	0	0.0	7	15.2
Not very successful	3	9.4	17	37.0
Highly unsuccessful	0	0.0	5	10.9
Total	32	100.%	46	100.0%

This question was also intended to determine whether schools that had remained on FMS during the 1976-1977 school year were entirely satisfied with the program. It was noted that 9.4 per cent or three of the thirty-three successful schools indicated that the FMS program was not very successful. The completion responses from those three schools indicated their problems in the following statements:

School A - Students can't handle unscheduled time.
Difficult to build a schedule without conflicts.
Teachers were getting lazy.

School B - Teachers and students were not utilizing non-class time wisely.
Building vandalism had increased greatly.
Couldn't avoid scheduling problems.
Couldn't keep track of students.

School C - Independent study facet didn't work.
Dropped large group pattern as it wasn't working well.

The other thirty successful schools rated their program either somewhat successful or highly successful.

An unusual response occurred when three unsuccessful schools rated their FMS programs as highly successful. A description of their 1976-1977 daily schedule and their responses to the advantages and disadvantages indicated:

School A - FMS to 9 period day.
Maintained some variable class times and large group/small group phases of instruction.

School B - FMS to 7 period day on 6 day cycle.
Major advantage was to break down traditional approaches to teaching.
This school did not adopt large blocks of unstructured time.
Would have continued but lacked adequate resource centers manned by teachers during the school day.

School C - FMS to 8 period day.
Added time for lab classes needed.
Made teachers and students plan each day.
Enlarged the curriculum.
No disadvantages.

In general, the over-all pattern of responses indicated that if the schools felt the program was satisfactory, they continued in FMS, however, if they felt the program was not satisfactory, they dropped FMS. The seventeen unsuccessful schools (36.9% of the unsuccessful schools), however, indicated that FMS was somewhat successful even though they no longer continued the program.

9. The various facets of FMS utilized by the school:

TABLE 8

FACETS OF FMS UTILIZED BY SUCCESSFUL AND UNSUCCESSFUL FMS SCHOOLS

Various Facets of FMS	Successful Schools In FMS		Unsuccessful Schools who Dropped FMS		All Schools in the Study	
Variable class times	33	100.0%	37	80.4%	70	88.6%
Large/small group	30	90.9	36	78.3	66	83.5
Independent study	30	90.9	35	76.1	65	82.3
Student lounge	29	87.9	36	78.3	65	82.3
Individual progress system	19	57.6	24	52.2	43	54.4
Computer built schedule	15	45.5	15	32.6	30	38.0
Team teaching	12	36.4%	20	43.5%	22	40.5%

The primary purpose of this question was to determine how widespread the various facets of FMS had been adopted by the Iowa high schools in this study. It was noted that in all instances, with the exception of "team teaching," the successful schools had adopted each facet to a greater degree than the unsuccessful schools. The team teaching facet, however, was adopted to a greater degree by the unsuccessful schools.

It was also noted that only thirty Iowa schools had a computer built FMS. The percentage of successful schools with computer built schedules was higher than the unsuccessful by almost 13 per cent.

The individual progress system was not widely adopted by the Iowa schools in FMS. Forty-three total schools or 54.4 per cent of the schools in the study utilized this independent study approach. Independent study was more widely accepted by successful schools as compared to the unsuccessful FMS schools.

Section 2. Responses to Questions Designed For The Study

This section contains the detailed results of the questions specifically designed to test the hypotheses of the study. In that one group contained more schools than the other, the percentage of each group giving a particular response was used for statistical comparisons. A line graph was used to illustrate the per cent of responses of the successful and unsuccessful schools to each alternative of each question. A line graph readily depicted obvious differences in emphasis between the successful and unsuccessful schools.

Question One - Facilities

During the time your school was utilizing an FMS program, were your facilities designed for a flexible modular scheduling program? Examples would include spaces for large group/small group instruction, resource centers for independent study, and, team teaching.

a. The facility was designed or remodeled to house a total FMS program.
b. Some remodeling or construction of a few new areas as done in the building.
c. Some minor changes were made in the building.
d. Very few changes were made in the building.
e. No changes were made in building design from a traditional program.

Response to question one:

All seventy-nine schools responded to this question. The thirty-three schools who continued to utilize FMS during the 1976-1977 school year were classified as successful. The forty-six schools who no longer utilized FMS during the 1976-1977 school year were described as unsuccessful.

Analysis of Data

Table 9 and graph 1 clearly depicted differences in facility provisions for FMS between the successful and unsuccessful schools. Not a single unsuccessful school had a facility designed for FMS. Only five (10.9%) of the unsuccessful schools had a facility in which some modifications were specifically designed for FMS.

Almost one in every four (24.2%) of the schools successful in FMS were in facilities designed for FMS.

TABLE 9

A COMPARISON BETWEEN IOWA PUBLIC HIGH SCHOOLS WHO WERE SUCCESSFUL AND UNSUCCESSFUL WITH FMS THE DEGREE FACILITIES WERE DESIGNED FOR FMS

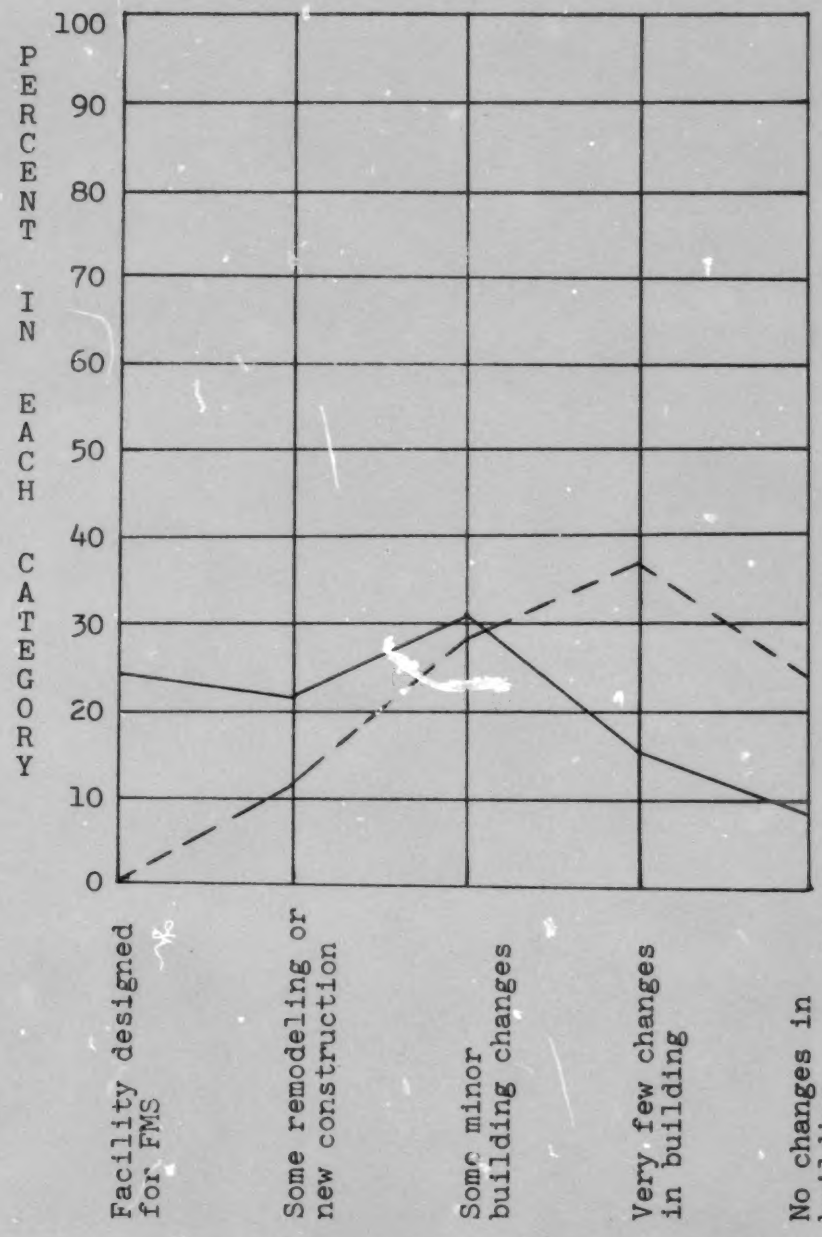
Degree Facility Modified for FMS	Successful Schools		Unsuccessful Schools	
Facility designed or remodeled for FMS	8	24.2%	0	0.0%
Some facility modifications of a few areas	7	21.2	5	10.9
Minor modifications	10	30.3	13	28.3
Very little modification	5	15.2	17	36.9
No modification in building design	3	9.1	11	23.9
Total	33	100.0%	46	100.0%

An additional 21.2 per cent were in facilities that were at least partly designed for FMS. The comparison between the first two categories was over four to one (45.4% to 10.9%) indicating a strong relationship of success in FMS and facilities designed for the program.

The percentage of both successful and unsuccessful schools that had made minor building modifications was almost identical with 30.3 per cent of the successful

GRAPH 1

THE DEGREE FACILITIES WERE DESIGNED FOR FMS



Classification:

——— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

and 28.3 per cent of the unsuccessful schools in that category.

The unsuccessful schools were found to dominate the last two categories. Twenty-eight of the forty-six (60.8%) unsuccessful schools fell into the categories where little or no modifications had been made in facilities. Only eight of thirty-three (24.3%) successful schools by comparison fell in that same category. The ratio of unsuccessful schools to successful schools in these two categories was just over two and one-half to one.

Question Two - In-service Training

How many sessions, consisting of one or more hours (including school visitations as a session), were spent in the in-service training of staff PRIOR to adoption?

Question two A alternatives:

a. In-service training was given consistently. All new staff members, year after year received training on the basic elements of FMS.
b. Some in-service training was given to new staff members on the basic elements of FMS.
c. Little in-service training was given to new staff members on the basic elements of FMS.

d. Almost no time was spent on introducing new staff members to the various facets of FMS

e. No time was spent in introducing new staff members to FMS.

Response to question two A:

All thirty-three schools successful in FMS responded to this question. Forty-four of forty-six (95.6%) of the unsuccessful schools in FMS responded to this question.

Analysis of Data

The mid-point on the scale (representing three to five in-service training sessions) in table 10 was found to have ten successful and ten unsuccessful FMS schools. This difference was less than eight per cent.

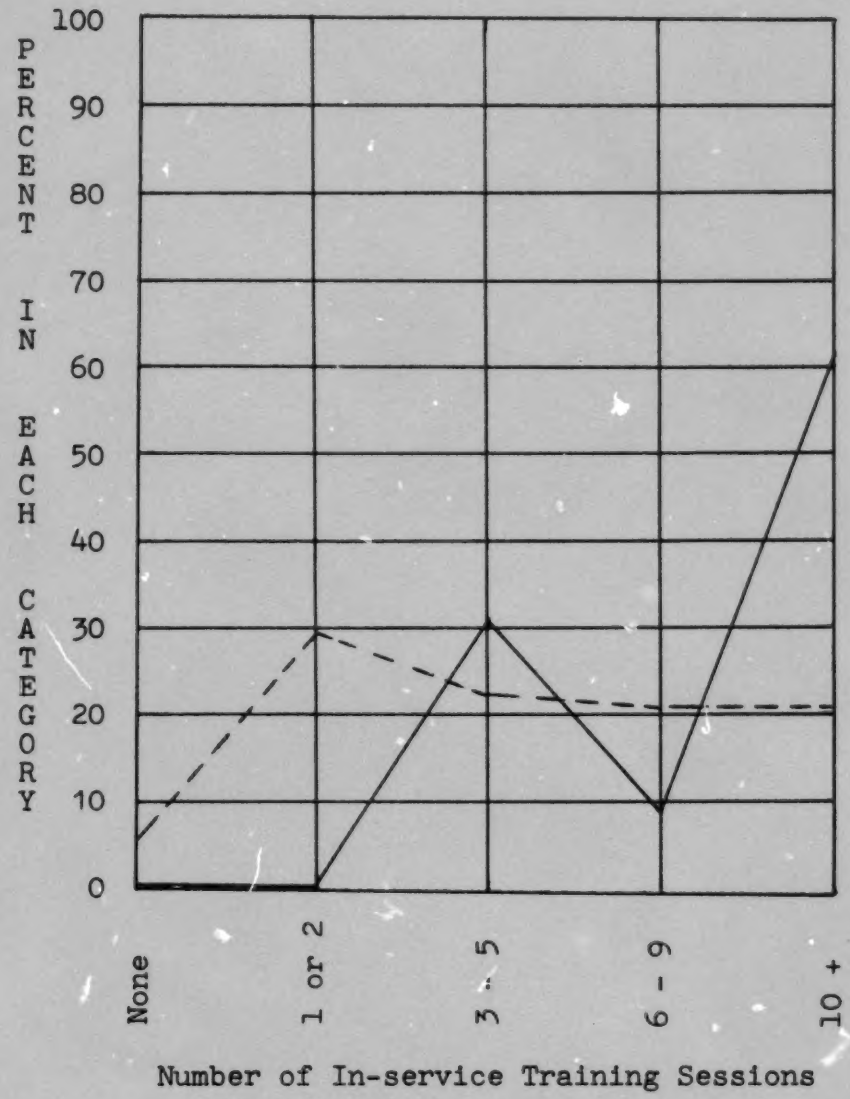
TABLE 10

NUMBER OF IN-SERVICE TRAINING SESSIONS SPENT ON FMS PRIOR TO IMPLEMENTATION

Number of Sessions	Successful Schools		Unsuccessful Schools	
None	0	0.0%	3	6.8%
1 or 2	0	0.0	13	29.5
3 to 5	10	30.3	10	22.7
6 to 9	3	9.1	9	20.5
10 or more	20	60.6	9	20.5
Total	23	100.0%	43	100.0%

GRAPH 2

AMOUNT OF TIME SPENT ON IN-SERVICE TRAINING OF STAFF ON FMS PRIOR TO ADOPTION



Classification:

———— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

However, a combination of less than three or more than five in-service training sessions did indicate a substantial difference. Not one single successful FMS school provided fewer than three in-service training sessions prior to the implementation of FMS. However, sixteen of the unsuccessful FMS schools (36.3%) provided fewer than three in-service sessions.

On the opposite end of the spectrum, twenty-three of the thirty-six successful FMS schools (69.7%) provided six or more in-service sessions. Eighteen unsuccessful FMS schools (41%) fell in that same category.

A more dramatic difference came on the schools that provided ten or more in-service training sessions. Twenty of thirty-three (60.6%) successful FMS schools fell in this category. This compared to only nine of forty-four (20.5%) of the unsuccessful FMS schools in the same category.

Question Two B

To what extent was in-service training of new staff members continued AFTER the implementation years?
Question two B alternatives:

a. In-service training was given consistently. All new staff members, year after year received training on the basic elements of FMS.
b. Some in-service training was given to new staff members on the basic elements of FMS.

c. Little in-service training was given to new staff members on the basic elements of FMS.

d. Almost no time was spent on introducing new staff members to the various facets of FMS.

e. No time was spent introducing new staff members to FMS.

Response to question two B:

All thirty-three schools successful in FMS responded to this question. Forty-five of the forty-six unsuccessful schools (97.8%) responded to this question.

Analysis of Data

It was noted in table 11 that all schools spent some time in the in-service training of new staff members. It was noted that only 12.1 per cent of the successful schools spent very little time with the in-service training of new staff in FMS. Eighteen of the forty-four unsuccessful schools (40%) fell in that same category.

Very few schools, three from both the successful and unsuccessful schools, gave in-service training to new staff consistently year after year. Some in-service training was provided to 57.6 per cent of the successful schools as compared to only 24.4 per cent of the unsuccessful schools.

Combining the two categories of "some" and "consistently" resulted in 66.7 per cent of the successful

schools as compared to 31.1 per cent of those schools who were unsuccessful with FMS.

TABLE 11

IN-SERVICE TRAINING OF STAFF IN FMS FROM YEAR TO YEAR

FMS Schools	Successful Schools		Unsuccessful Schools	
None	0	0.0%	0	0.0%
Very little	4	12.1	18	40.0
Little	7	21.2	13	28.9
Some	19	57.6	11	24.4
Consistently	3	9.1	3	6.7
Total	33	100.0%	45	100.0%

Question Three - Community Involvement

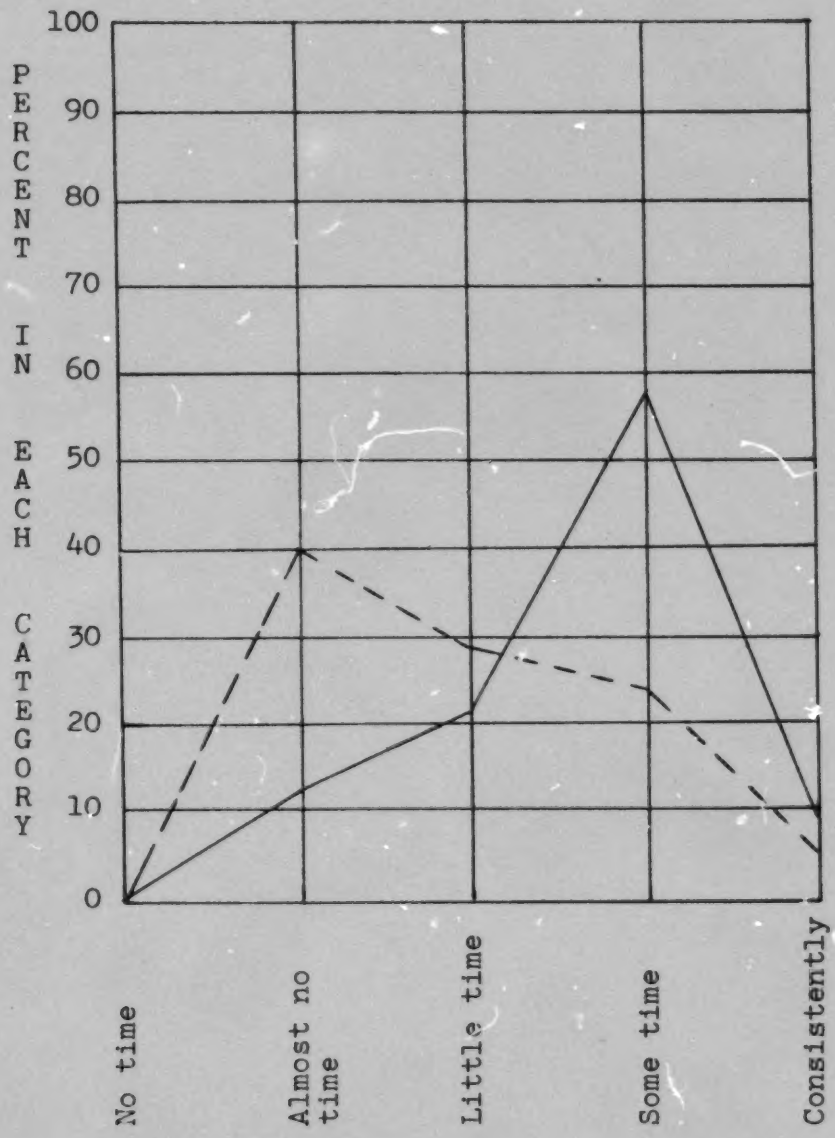
To what extent were members of the community, other than the Board of Education, involved in the examination of FMS PRIOR TO its ADOPTION in your school system?

Question three alternatives:

a. There was direct community involvement with several community members working on either a steering committee or on an advisory basis.

GRAPH 3

EXTENT OF IN-SERVICE TRAINING GIVEN EACH YEAR WITH NEW STAFF MEMBERS AFTER IMPLEMENTATION OF FMS



Classification:

——— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

b. There was some community involvement with lay citizen participation.

c. Community informational meetings were held.

d. There was some involvement, but mostly on an informational basis with the Board being the only direct lay citizen involvement.

e. There was no involvement what-so-ever by the community.

Response to question three:

All thirty-three schools who were successful in FMS responded to this question. Forty-four of the forty-six unsuccessful schools (95.7%) responded to this question.

Analysis of Data

As noted in table 12, only one successful FMS school was found to have had no community involvement. Eleven unsuccessful schools (24.5%) had no community involvement. Combining the categories of "no involvement" and "Board only" resulted in 27.2 per cent of the successful schools compared to 68.9 per cent of the unsuccessful schools.

The mid-point in community involvement found less than a three per cent difference between the successful and unsuccessful schools (18.2% to 15.6%).

The highest degree of community participation involved having citizens working either on steering

committees or on advisory councils. Only 4.4 per cent of the unsuccessful schools involved a high degree of lay citizen participation. However, 18.2 per cent of the successful schools involved their community to a great degree.

An even more dramatic difference was found when the two categories of greater community participation were combined. In that instance, 54.6 per cent of the successful schools fell into that combined category compared to only 15.5 per cent of the unsuccessful schools.

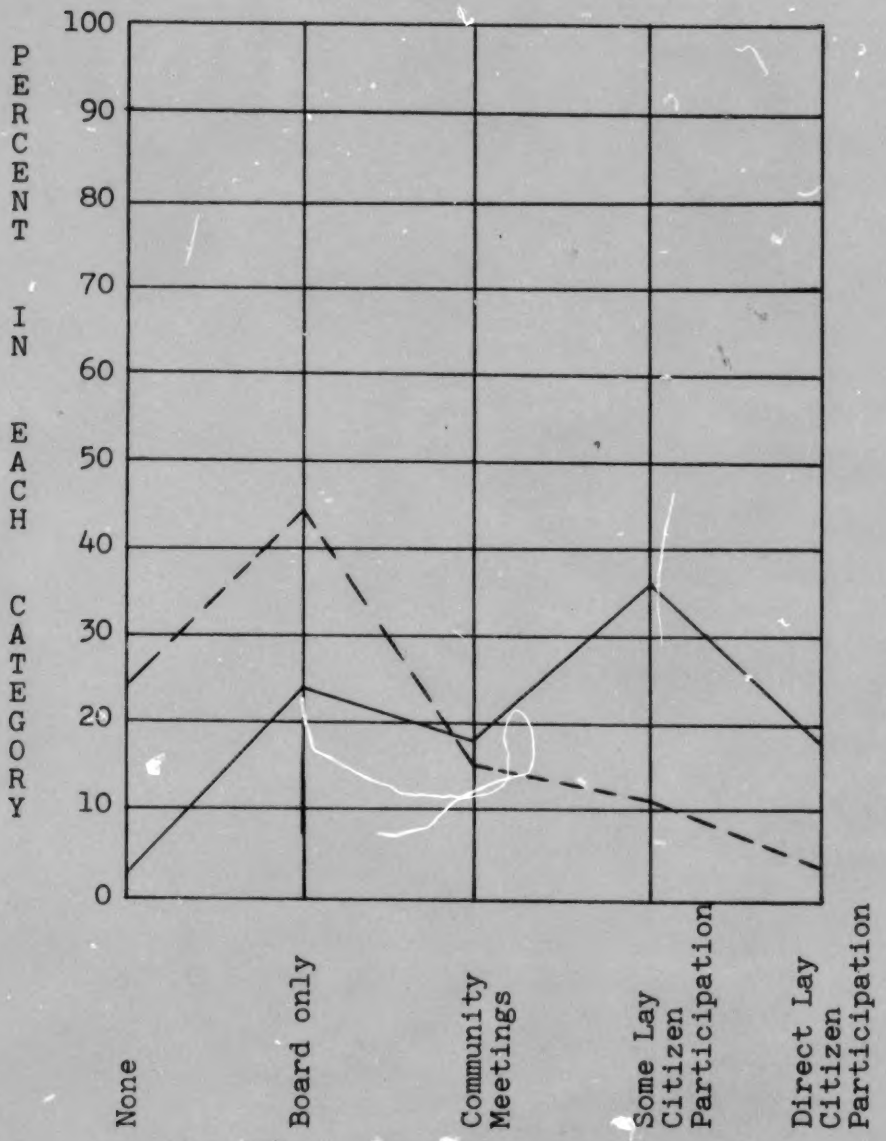
TABLE 12

COMMUNITY INVOLVEMENT IN MAKING DECISION ON FMS

Community Involvement	Successful Schools		Unsuccessful Schools	
No Involvement	1	3.0%	11	24.5%
Board Only	8	24.2	20	44.4
Community Meetings Only	6	18.2	7	15.6
Some Lay Citizen Participation	12	36.4	5	11.1
Direct in Steering or Advisory	6	18.2	2	4.4
Total	33	100.0%	45	100.0%

GRAPH 4

COMMUNITY INVOLVEMENT IN MAKING FMS DECISION



Classification:

———— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

Question Four - Curriculum Modification

To what extent were teaching techniques and methodology "modified" after your school adopted an FMS program?

Question four alternatives:

a. No change occurred in technique or methodology in any classes.
b. Very few classes experienced any change.
c. Several classes were effected but mostly in time allocation.
d. Quite a few classes experienced change.
e. A great deal of change occurred in a majority of the classes.

Response to question four:

All thirty-three schools who were successful in FMS responded to this question. Forty-five of forty-six unsuccessful schools (97.8%) responded to this question.

Analysis of Data

The data in table 13 indicated that all schools in the study experienced some change in teaching technique and methodology in the adoption of an FMS program. This was evidenced by the zero response to the category "no change."

TABLE 13

DEGREE TEACHING TECHNIQUES AND METHODOLOGY WERE MODIFIED IN TOTAL SCHOOL PROGRAM

FMS Schools	Successful Schools		Unsuccessful Schools	
No Change	0	0.0%	0	0.0%
Very Few Changes	1	3.0	10	22.2
Several Changes	9	27.3	23	51.1
Many Changes	17	51.5	9	20.0
Most Changed	6	18.2	3	6.7
Total	33	100.0%	45	100.0%

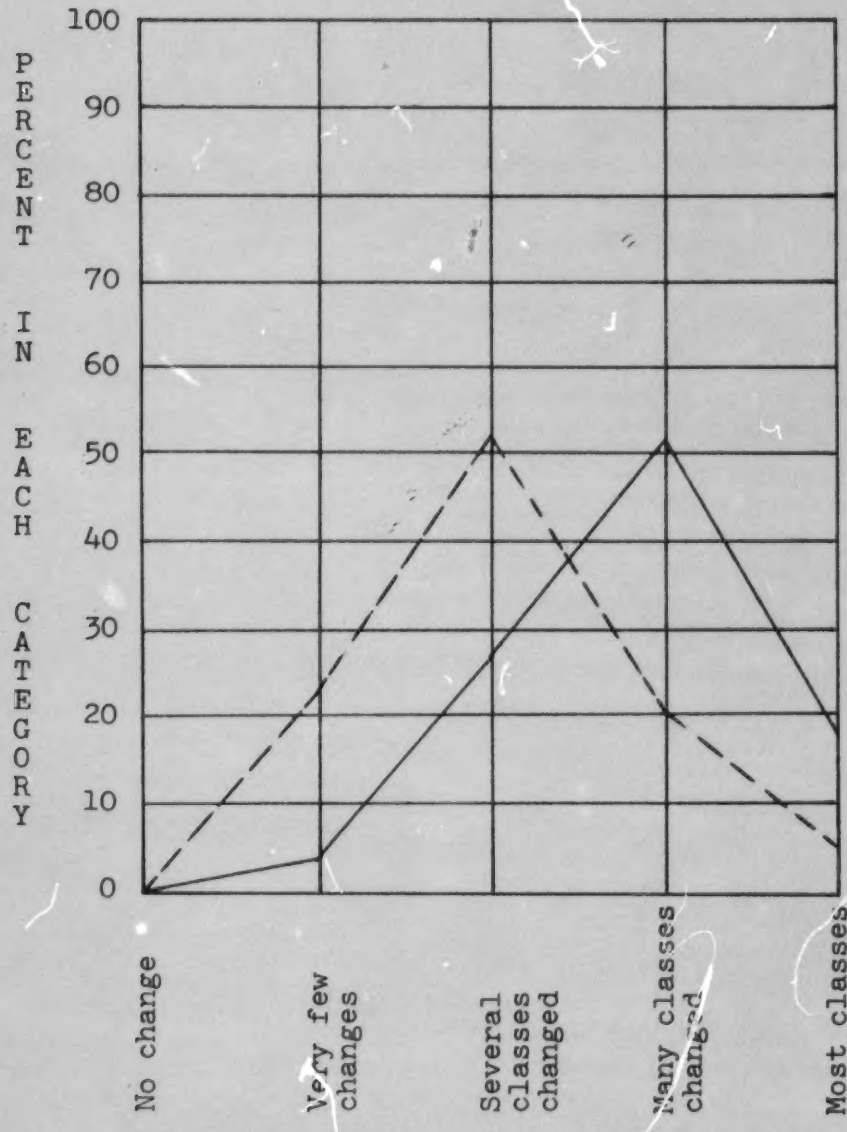
The second category involved schools that had made very few changes. Only one successful school was found in that category compared to ten of the unsuccessful.

A majority (51.5%) of the unsuccessful schools fell into the middle category that involved several changes. That compared with 27.3 per cent of the successful schools. By combining the categories from "no change" to "several changes," over 73 per cent of the unsuccessful schools fell into that grouping. This compared to just over 30 per cent in the successful schools.

The greater and greatest degrees of program modification were found in the last two responses which

GRAPH 5

DEGREE TEACHING TECHNIQUES AND METHODOLOGY WERE MODIFIED IN TOTAL SCHOOL PROGRAM



Classification:
——— Schools Successful in FMS
-------- Schools Unsuccessful in FMS

included "many changes" and "most changed." Twenty-three of the thirty-three successful schools (69.7%) fell in those categories. This compared to only twelve of forty-five schools (26.7%) in the unsuccessful classification.

A majority (51.5%) of the successful schools fell in the category that had made many changes.

The line graph clearly depicted the unsuccessful schools as higher on the lesser degrees of emphasis in change and lower on the greater degrees of modification.

Question Five - Independent Study

How would you describe the independent study phase of FMS as it was utilized in your school system?
Question five alternatives:

a. A complete failure
b. Not too successful
c. No different from our traditional schedule
d. An important component
e. A very vital part

Response to question five:

All thirty-three schools who were successful in FMS responded to this question. Forty-five of forty-six (97.8%) of the unsuccessful schools responded to this question.

Analysis of Data

Table 14 indicated that no one response could describe successful schools. However, only 3 per cent of the successful schools rated independent study as a complete failure while 6.1 per cent rated it as a very vital part of their FMS program.

Graph 6 clearly depicted the unsuccessful schools with a definite skew to the left, indicating independent study was either not successful or a complete failure.

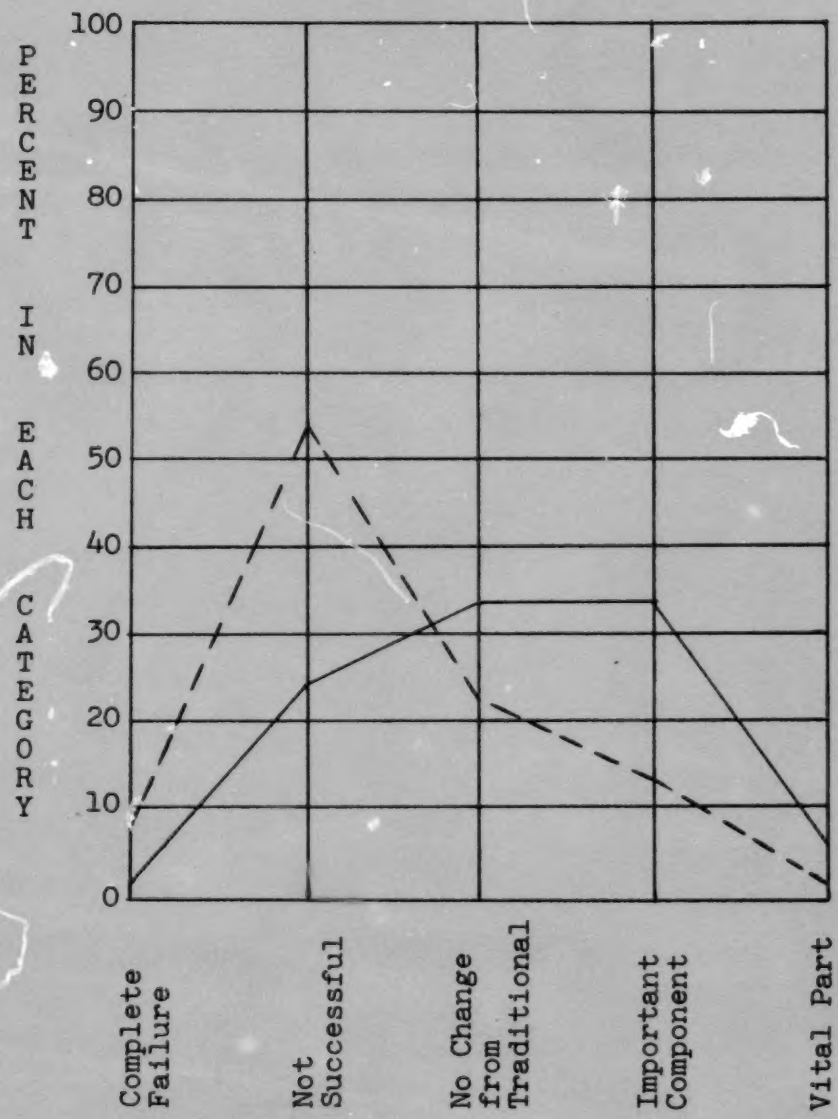
The degrees of emphasis did differ between the successful and the unsuccessful schools. Those schools who reported that independent study was not successful or even a complete failure represented 62.3 per cent of the unsuccessful schools and 27.3 per cent of the successful schools. This represents an over two to one opinion of the non-success of independent study by the unsuccessful versus successful schools.

Only 15.5 per cent of the unsuccessful schools and 39.4 per cent of the successful schools classified independent study as an important or vital part of an FMS program. Successful schools had more than twice as much success with independent study when compared to the unsuccessful schools.

Neither successful or unsuccessful schools viewed independent study as a "vital" part of an FMS program.

GRAPH 6

DESCRIPTION OF THE INDEPENDENT STUDY FACET OF THE SCHOOLS' FMS PROGRAMS



Classification:

——————— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

The one single response of both successful and unsuccessful schools that stood out from all the other data was the twenty-four (53.3%) of the unsuccessful schools that indicated that independent study was not successful. This single response represented a majority opinion of all forty-five of the unsuccessful schools.

TABLE 14

DESCRIPTION OF THE INDEPENDENT STUDY FACET OF THE SCHOOLS' FMS PROGRAMS

FMS Schools	Successful Schools		Unsuccessful Schools	
Complete failure	1	3.0%	4	8.9%
Not successful	8	24.3	24	53.4
No change from traditional	11	33.3	10	22.2
Important component	11	33.3	6	13.3
Very vital part	2	6.1	1	2.2
Total	33	100.0%	45	100.0%

Question Six - Discipline

Question 6 A:

To what extent did student discipline problems change in CLASSROOMS during the first one or two years of the FMS program?

Question 6 A alternatives:

a. Decreased greatly
b. Decreased somewhat
c. No change
d. Increased somewhat
e. Increased greatly

Response to question 6 A:

Thirty-one of thirty-three (93.9%) of the schools who were successful in FMS responded to this question. All forty-six unsuccessful schools responded to this question.

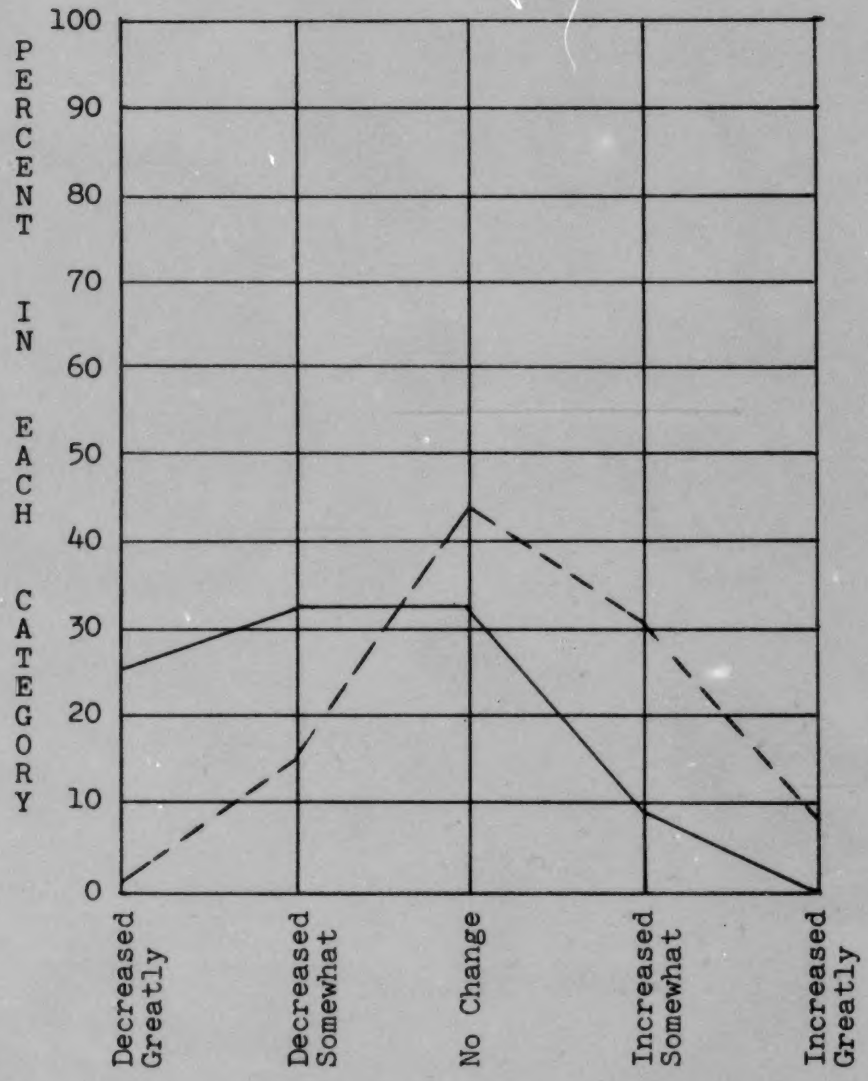
Analysis of Data

The degree of difference between the successful and unsuccessful schools in classroom discipline problems was quite pronounced. Only one unsuccessful school (2.2%) indicated discipline problems had decreased greatly. Eight successful schools (25.8%), however, indicated that discipline had decreased greatly. By combining the second category of decrease of "decreased somewhat," a majority of the unsuccessful schools (58.1%) indicated that discipline problems in classrooms were less. Only 17.4 per cent of the unsuccessful schools were found in that same category.

The opposite degree of difference involved discipline problems in class increasing greatly. Not one single school successful in FMS indicated that

GRAPH 7

EXTENT STUDENT DISCIPLINE PROBLEMS CHANGED IN CLASSROOMS



Classification:
——— Schools Successful in FMS
-------- Schools Unsuccessful in FMS

discipline problems had increased greatly. In fact, only 9.6 per cent indicated discipline problems in classrooms had even increased somewhat. This compared to 39.1 per cent of the unsuccessful schools that had experienced from some increase to a great amount. A sizeable percentage of both groups indicated "no change."

TABLE 15

EXTENT STUDENT DISCIPLINE PROBLEMS CHANGED IN CLASSROOMS DURING THE FIRST ONE OR TWO YEARS OF THE FMS PROGRAM

FMS Schools	Successful Schools		Unsuccessful Schools	
Decreased greatly	8	25.8%	1	2.2%
Decreased somewhat	10	32.3	7	15.2
No change	10	32.3	20	43.5
Increased somewhat	3	9.6	14	30.4
Increased greatly	0	0.0	4	8.7
Total	31	100.0%	46	100.0%

Question Six B

To what extent did student discipline problems change in areas OTHER than the classroom during the first one or two years of the FMS program?

Question 6 B alternatives:

a. Decreased greatly

b. Decreased somewhat

c. No change

d. Increased somewhat

e. Increased greatly

Response to question 6 B:

Thirty-one of thirty-three schools (93.9%) responded to this question. Forty-five of the forty-six unsuccessful schools (97.8%) responded to this question.

Analysis of Data

The data in table 16 clearly indicated that both the successful and unsuccessful schools in FMS had problems with discipline in areas other than the classroom. Only 6.5 per cent of the successful schools concluded that discipline problems had increased greatly. However, 37.8 per cent of the unsuccessful schools indicated that discipline problems had, in fact increased greatly. This was almost a six to one ratio.

The single largest category involved discipline problems increasing somewhat. Nineteen (61.3%) of the successful schools indicated that discipline problems had increased to some degree. An additional 22.6 per cent of the successful schools indicated that discipline problems had not changed. Thus, from no change to some

increase accounted for 83.9 per cent of the successful schools.

Twenty of the unsuccessful schools (44.4%) indicated that discipline had increased somewhat. Only 13.3 per cent of the unsuccessful schools had indicated "no change." However, when combining the two categories of increased problems, 82.2 per cent or thirty-seven of the forty-five unsuccessful schools fell into those categories.

Only 4.4 per cent or two unsuccessful schools indicated that discipline problems had decreased. A total of three successful schools (6.5%) indicated a decrease in the same category.

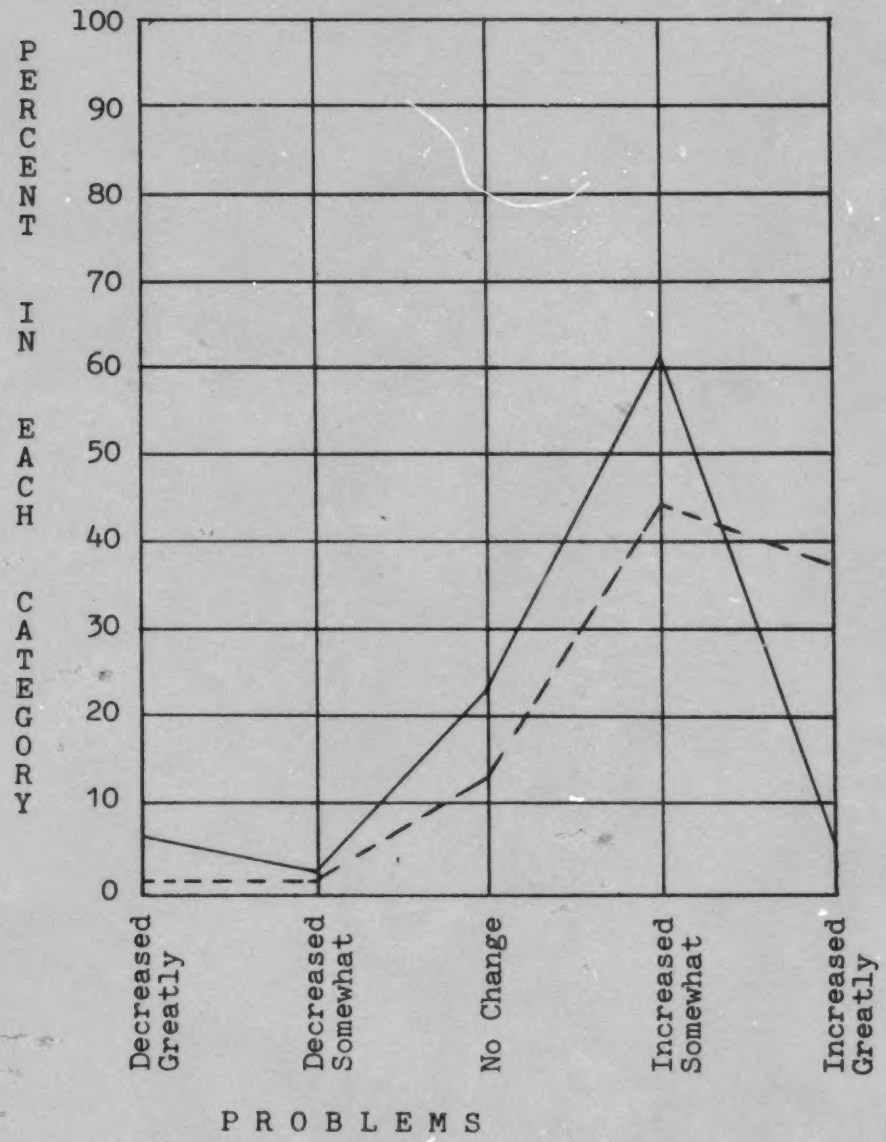
TABLE 16

EXTENT STUDENT DISCIPLINE PROBLEMS CHANGED IN AREAS OTHER THAN CLASSROOMS FIRST YEARS OF FMS PROGRAM

FMS Schools	Successful Schools		Unsuccessful Schools	
Decreased greatly	2	6.5%	1	2.25%
Decreased somewhat	1	3.2	1	2.25
No change	7	22.6	6	13.3
Increased somewhat	19	61.3	20	44.4
Increased greatly	2	6.5	17	37.8
Total	31	100.0%	45	100.0%

GRAPH 8

EXTENT STUDENT DISCIPLINE PROBLEMS CHANGED IN AREAS OTHER THAN CLASSROOMS FIRST YEARS OF FMS PROGRAM



Classification:

———— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

Question Seven - Changes After FMS Adoption

To what extent did your school MODIFY various facets of the FMS program AFTER it was adopted?

Question seven alternatives:

a. No modification
b. Little modification
c. Some modification
d. Considerable modification
e. Abandoned FMS completely

Response to question seven:

All thirty-three schools who were successful and all forty-six schools who were unsuccessful in FMS responded to this question.

Analysis of Data

A definite pattern existed on the responses given by all thirty-three successful schools as shown in table 17. Not one successful school indicated either "no change" or "abandoned the FMS program." This question served as a check-point to determine if the responder had, in fact, read the question. A zero response by the successful schools to the last alternative was indication that the question was read carefully.

A majority of the successful schools did make some modifications to the FMS program after its adoption as indicated by the 63.6 per cent response to that alternative.

TABLE 17

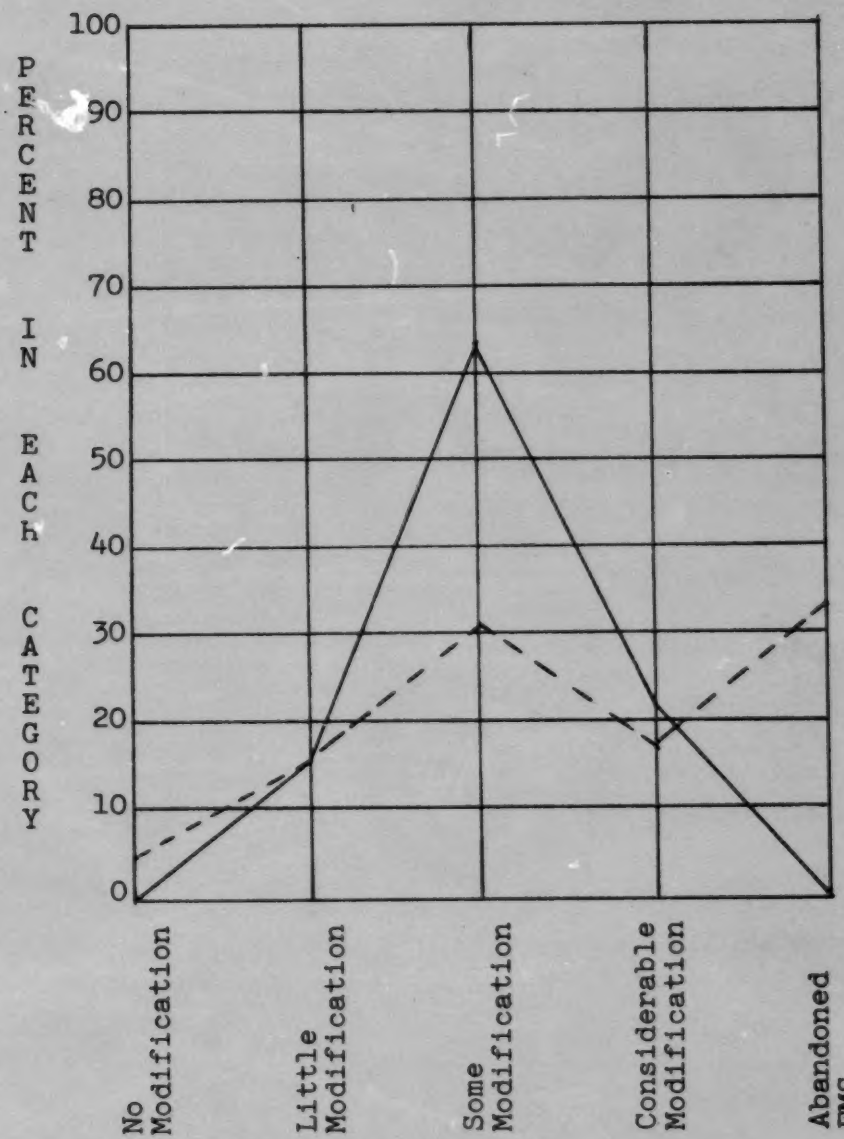
EXTENT FMS MODIFIED AFTER ADOPTION

FMS Schools	Successful Schools		Unsuccessful Schools	
No Modification	0	0.0%	2	4.4%
Little Modification	5	15.2	7	15.2
Some Modification	21	63.6	14	30.4
Considerable Modification	7	21.2	8	17.4
Abandoned FMS	0	0.0	15	32.6
Total	33	100.0%	46	100.0%

The responses by the unsuccessful schools were scattered and did not give any indication of particular emphasis. The only indicative response or lack of was the 4.4 per cent that indicated "no changes" or modifications made. The question may not have been clear to many respondents in the unsuccessful schools, or, no particular degree of emphasis existed. Several respondents in the unsuccessful schools asked "At what point in time?" If the unsuccessful schools marked the question at the end of their experience in FMS, all forty-six would have responded "Abandoned FMS."

GRAPH 9

EXTENT FMS MODIFIED AFTER ADOPTION



Classification:

——— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

Approximately one-third of the unsuccessful schools did mark that response. This question appeared to lack proper design for respondents in the unsuccessful classification. This question was cross-referenced to a completion question in the third section of this chapter. The completion question was directed only toward those schools who remained on an FMS program. It was noted that the thirty-three successful schools were consistent in their responses between this question and the completion question that asked the respondent to list the most important changes or adjustments made in their FMS program AFTER adoption. All successful schools in FMS did list one or more changes or adjustments that had been made.

Question Eight - FMS and Academic Achievement

First question: Did your school formally evaluate FMS in terms of student achievement?

First question alternatives:

a. Did not evaluate FMS in terms of student achievement.
b. No change was made in any evaluation procedures.
c. A little additional effort was spent in evaluating student achievement.
d. Some additional effort was spent in evaluating student achievement.
e. Yes. A great deal of time and effort was spent in evaluating student achievement.

Response to first part of question eight:

All thirty-three schools who were successful in FMS responded to this question. All forty-six schools who were unsuccessful in FMS also asnwered this question.

Analysis of Data

The successful schools spent more effort evaluating FMS than the unsuccessful schools. However, graph 10 clearly depicts that there was little difference.

TABLE 18

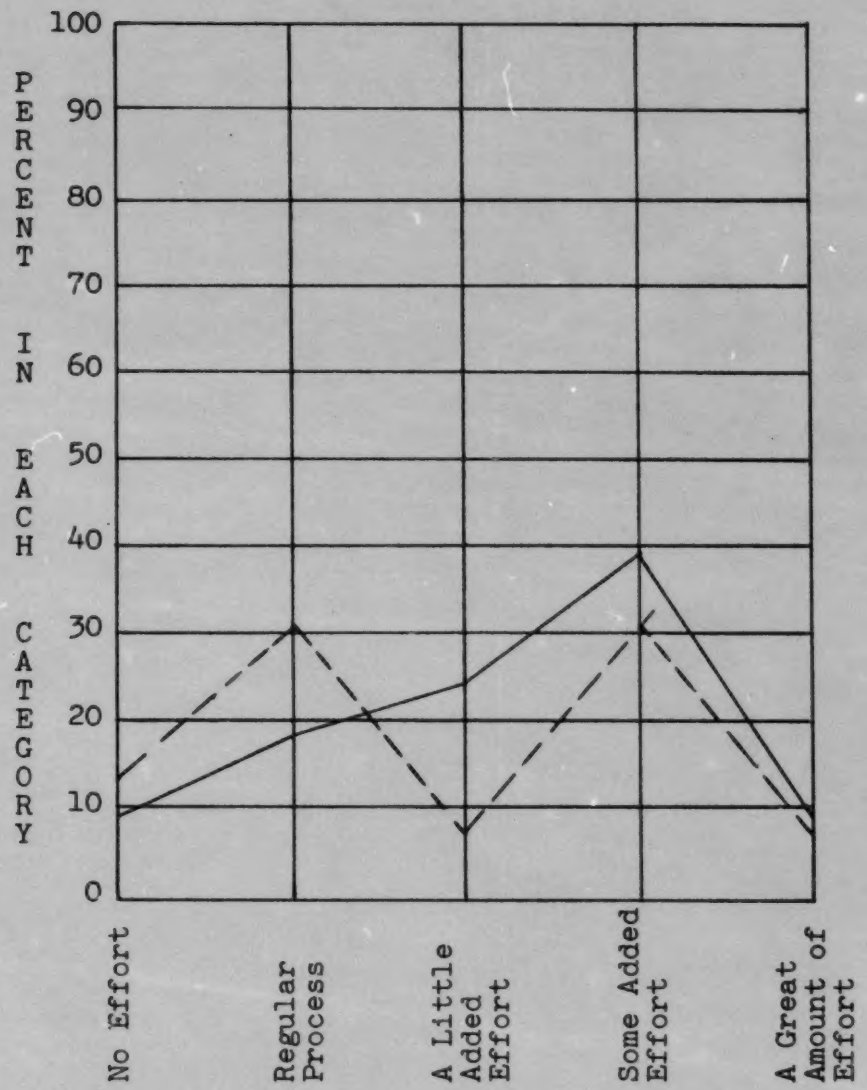
EFFORT SPENT FORMALLY EVALUATING FMS

FMS Schools	Successful Schools		Unsuccessful Schools	
No Effort	3	9.1%	6	13.1%
Regular Process	6	18.2	14	30.4
A Little Added Effort	8	24.2	3	6.5
Some Added Effort	13	39.4	14	30.4
A Great Amount of Effort	3	9.1	3	6.5
Total	33	100.0%	46	100.0%

Twenty of the unsuccessful schools (43.5%) did not expand any extra effort evaluating a new program. Nine of the successful schools (27.3%) fell in the same category.

GRAPH 10

EFFORT SPENT FORMALLY
EVALUATING FMS



Classification:
——— Schools Successful in FMS
-------- Schools Unsuccessful in FMS

Only six out of seventy-nine schools (7.6%) made a very definite attempt to evaluate a new and innovative program. Only 9.1 per cent of the successful schools and 6.5 per cent of the unsuccessful schools expanded great effort.

There was indication that the successful schools did put forth more effort in evaluating FMS but the significance of the difference was minimal.

Second question: (Schools were to answer only if they had evaluated FMS in terms of student achievement.) What were the results of any of the comparison studies that were made on student academic achievement?

Second question alternatives:

a. FMS results were considerably lower
b. FMS results were slightly lower
c. No difference
d. FMS results were slightly higher
e. FMS results were considerably higher

Response to second part of question eight:

Twenty-two of the thirty-three schools responded to this question. Twenty-four of the thirty-three had indicated that their school had evaluated FMS to some degree. The responding rate of this group because of the qualifying statement equalled 91.6 per cent.

Twenty-four of forty-six unsuccessful schools responded to this question. Twenty-six of the forty-six

had indicated that their school had evaluated FMS to some degree. The responding rate of this group because of the qualification was 92.3 per cent.

Analysis of Data

The data in table 19 indicated that only one school of forty-six reported that FMS had resulted in considerably lower academic achievement on the part of the students. Ten unsuccessful schools, however, reported slightly lower results with FMS compared to only three schools in the successful classification. By combining the categories with the lower academic results, a more pronounced difference occurred. The successful schools had only 13.6 per cent of their number report lower results compared to 45.8 per cent of those schools who were unsuccessful.

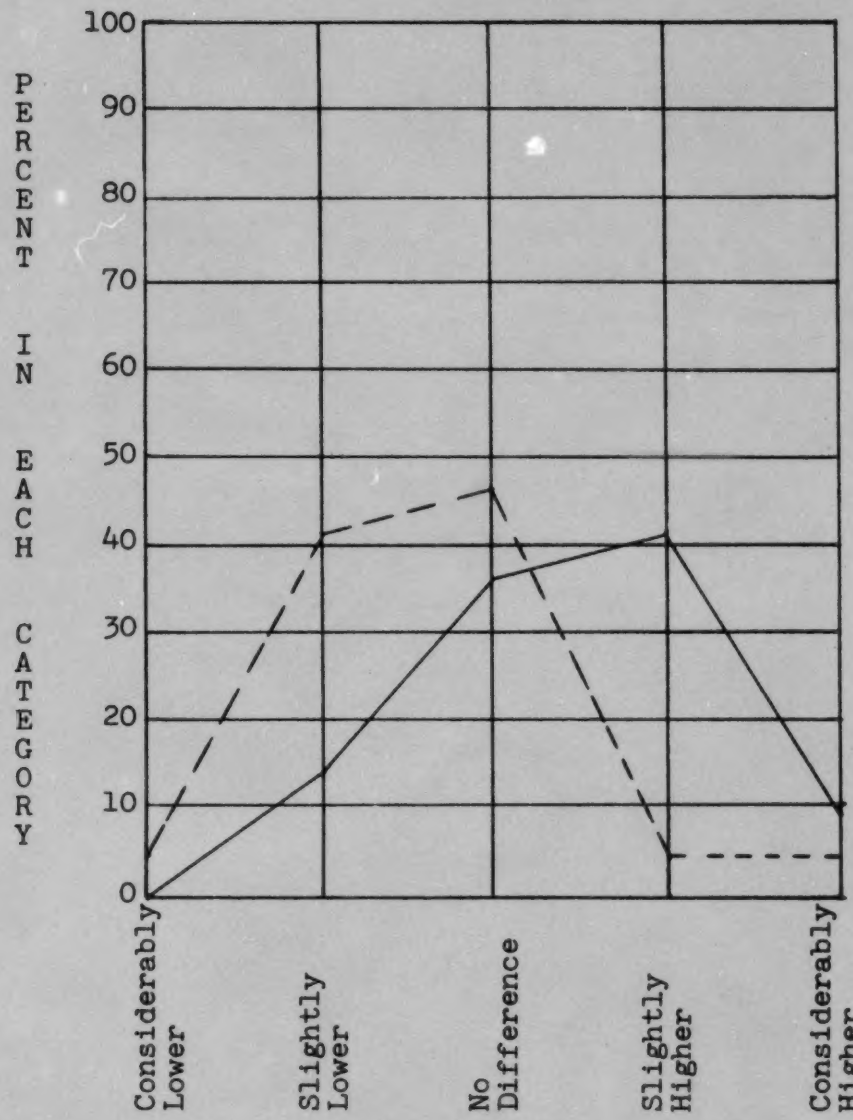
TABLE 19

RESULTS OF COMPARISON STUDIES OF FMS COMPARED TO TRADITIONAL ON STUDENT ACADEMIC ACHIEVEMENT

FMS Schools	Successful Schools		Unsuccessful Schools	
FMS Considerably Lower	0	0.0%	1	4.2%
FMS Slightly Lower	3	13.6	10	41.6
No Difference	8	36.4	11	45.8
FMS Slightly Higher	9	40.9	1	4.2
FMS Considerably Higher	2	9.1	1	4.2
Total	22	100.0%	24	100.0%

GRAPH 11

RESULTS OF COMPARISON STUDIES OF FMS COMPARED TO TRADITIONAL ON STUDENT ACADEMIC ACHIEVEMENT



Classification:
———— Schools Successful in FMS
-------- Schools Unsuccessful in FMS

Nineteen total schools indicated that they found no difference in academic achievement. The unsuccessful schools had 45.8 per cent of their numbers expressing that opinion compared to 36.4 per cent of the successful schools in the same category.

The line graph depicted a great deal of difference, however, on schools that reported higher results. By combining the two cells of higher academic achievement, eleven successful schools (50%) fell into those categories. This compared to only two unsuccessful schools or 8.4 per cent of that group.

The data indicated that successful schools tended to report slightly higher achievement while unsuccessful schools reported slightly lower results.

Question Nine - Supplemental Resource Materials

When your school adopted a FMS program, did the expenditures made for "supplemental resource materials" change?

Question nine alternatives:

a. Decreased expenditures
b. No change
c. Very little increase
d. Nearly doubled
e. More than doubled

Response to question nine:

All thirty-three of the schools successful in FMS responded. Forty-four of the forty-six (95.6%) unsuccessful schools responded. The two unsuccessful schools that did not select a choice commented that they didn't know and the information wasn't available.

Analysis of Data

Table 20 indicated that neither successful or unsuccessful schools spent less for supplemental resource materials. Only one school in the study more than doubled its expenditures for supplemental resource materials. That school was successful and represented only 3 per cent of those schools. This single response did not indicate any degree of significance until combined with the category "nearly doubled." Schools that either doubled or nearly doubled their expenditures for supplemental materials totaled 36.3 per cent of the successful schools. This was nearly double that of the unsuccessful schools (18.1%).

The category of "little increase" had less than a 4 per cent difference between the successful and unsuccessful schools but contained a majority of the schools in both classifications.

The number of unsuccessful schools more than tripled the number of successful schools in the category that involved "no change" in expenditures (20.5% to 6.1%).

TABLE 20

CHANGES IN DOLLARS SPENT FOR "SUPPLEMENTAL RESOURCE MATERIALS" WHEN ADOPTING AN FMS PROGRAM

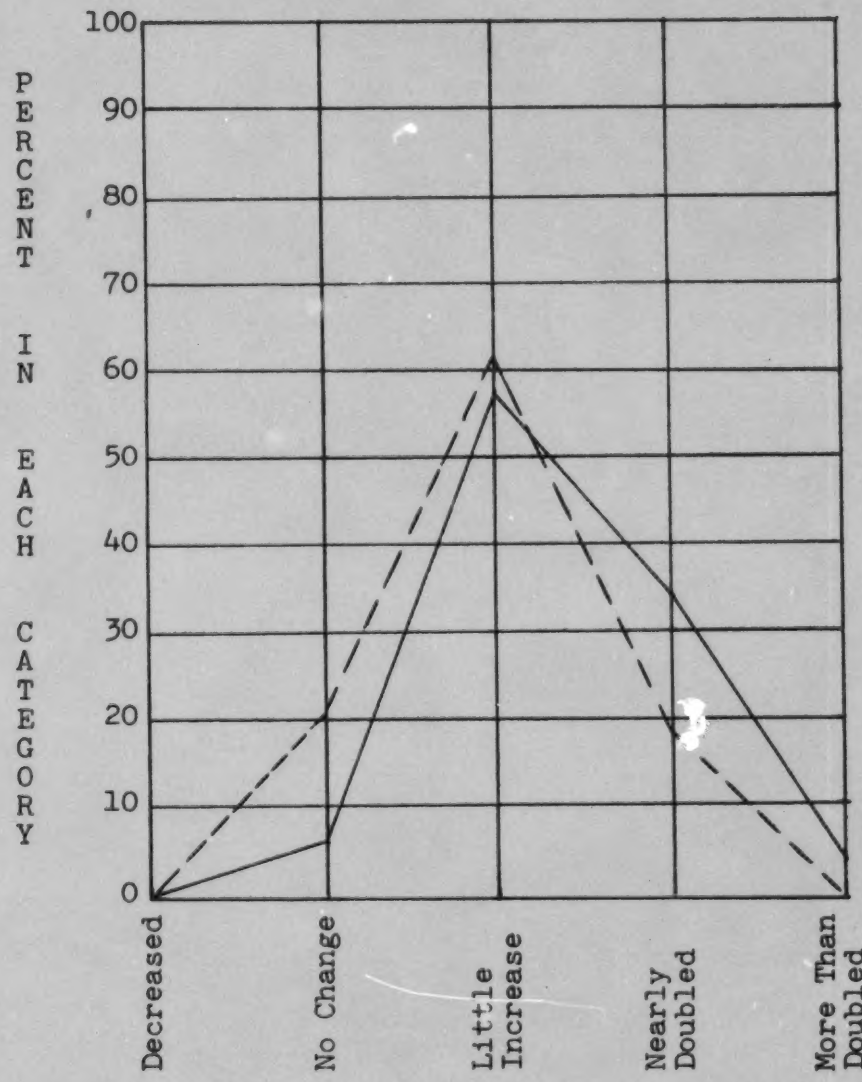
FMS Schools	Successful Schools		Unsuccessful Schools	
Decreased	0	0.0%	0	0.0%
No Change	2	6.1	9	20.5
Little Increase	19	57.6	27	61.4
Nearly Doubled	11	33.3	8	18.1
More Than Doubled	1	3.0	0	0.0
Total	33	100.0%	44	100.0%

Only 6.1 per cent of the successful schools did not spend more for supplemental materials. However, 81.9 per cent of the unsuccessful schools spent little or no additional dollars for supplemental resource materials. An 18 per cent difference in any combination between the successful and unsuccessful schools was as great as could be found in table 20 by two or three category combinations.

The data indicated only a slight degree of emphasis toward the expenditure of more funds for supplemental materials for successful schools but hardly adequate to prove of any significance.

GRAPH 12

CHANGES IN DOLLARS SPENT FOR "SUPPLEMENTAL RESOURCE MATERIALS" WHEN ADOPTING AN FMS PROGRAM



Classification:

——— Schools Successful in FMS

-------- Schools Unsuccessful in FMS

Section 3. Advantages, Disadvantages and Major Adjustments in FMS Programs

A third section of the questionnaire asked respondents to give brief statements as to what they considered to be the major advantages or disadvantages of their FMS programs.

The third and final question on the study was only completed by those schools who continued to utilize an FMS program.

The first two questions were answered by seventy-two of the seventy-nine schools in the study. All thirty-three of the successful schools completed this section.

The last question was completed by all thirty-three of the schools who were successful in FMS.

What were the major advantages of your FMS program?

TABLE 21

MAJOR ADVANTAGES OF FMS AS REPORTED BY THE 33 PUBLIC HIGH SCHOOLS STILL IN FMS

No. of Schools Making Response	Response
27	Students were able to take more classes and/or the school offered more classes.
12	It improved student/teacher relationship and has made teachers more accessible to students for individual help.
12	The ability to vary the size of group according to its purpose.

TABLE 21-Continued

No. of Schools Making Response	Response
11	Variable length of mods for the subjects needing longer or shorter blocks of time.
5	Schedule-back available to students who need additional help.
5	Variety in school day - one day does differ from another.
5	Teachers have more input into their daily schedule.
4	Student develops individual responsibility.
3	Helped to make staff more aware of other educational alternatives within a class for all students.
2	Teachers can teach more classes and still have preparation time.
2	Introduced continual progress courses.
2	Smaller class sizes for discussion purposes.
2	Helped to improve student attitude toward schools.
1	Helped the academically talented student.
1	Less traffic in hallways because classes change at varying times.

TABLE 22

MAJOR ADVANTAGES OF FMS AS REPORTED BY THE 46 PUBLIC HIGH SCHOOLS THAT "DROPPED" FMS

No. of Schools Making Response	Response
18	Students were able to take more classes and/or the school offered more classes.
16	More time provided for laboratory classes.

TABLE 22-Continued

No. of Schools Making Response	Response
13	More capable and/or motivated students could accomplish more.
13	FMS helped to break the textbook approach to teaching. It helped bring about a more individualized program. Small group and large group instructional approaches were introduced.
11	Teach students how to handle responsibility to be able to work on their own, and learn how to utilize Independent Study time.
7	Teachers could work more individually with students.
7	No advantages.
6	The variety of periods or mods breaks the boredom of a daily schedule that repeats and repeats for 180 school days.
5	It provides a better use of time, teachers can schedule back those who need it, and help others move ahead, L.G. for tests and films as additional examples.
2	"In" class discipline problems decreased.
2	Teachers are now more flexible in teaching approaches.
1	No study halls.
1	Graduate more at mid-term.
1	Room and teacher schedule conflicts decreased.
1	Student morale improved.
1	Introduced the use of clerical aides.

What were the major disadvantages of your FMS program?

TABLE 23

MAJOR DISADVANTAGES OF FMS AS REPORTED BY THE 33 PUBLIC HIGH SCHOOLS STILL IN FMS

No. of Schools Making Response	Response
25	Most students do not utilize independent study time in a constructive manner. They waste time and cause problems.
11	Accountability of students, attendance taking, and keeping track of students presents problems.
6	"Some" teachers are not willing to do the extra work this type of schedule requires.
6	Have problems with student schedules; too many conflicts, schedule backs, and many are a problem for both student and teacher.
6	More movement of students increased discipline problems.
4	Need to have more educational materials, but budgets are too tight to allow for course needs.
3	FMS requires more staff both professional and non-certified.
3	Too little pressure is put on students to perform and meet deadlines.
2	Tried to do too much in way of course offerings.
1	Some teachers did not vary their teaching techniques.
1	Over-crowded building has caused problems.
1	Needs more in-service training of staff.
1	Caused an increase in early graduation.
1	Poor use of unscheduled time but it was no different than our traditional schedule.

TABLE 24

MAJOR DISADVANTAGES OF FMS AS REPORTED BY THE 46 PUBLIC HIGH SCHOOLS THAT "DROPPED" FMS

No. of Schools Making Response	Response
27	Students had difficulty utilizing free or unscheduled time in a constructive manner - too much free time.
15	Discipline and vandalism problems increased greatly.
12	Attendance and accountability problems increased greatly.
9	The average and below average students achieved less. It set our school back academically.
7	Teachers were not able to use free time wisely.
5	Facilities were not designed for an FMS program.
4	Scheduling problems.
4	Faculty opposition.
3	Time wasted in passing times between mods.
3	Student lounge did not work.
3	Too much change in too little time.
3	Poor student attitudes developed.
2	Too little time spent in some classes.
2	Teacher preparation time increased.
2	People in community upset because kids weren't in classes or school.
2	Required more supervision.
2	Not enough in-service training of staff available.
1	It was not as flexible as was desired.

TABLE 24-Continued

No. of Schools Making Response	Response
1	Bells ringing every 20 minutes were too distracting.
1	Teachers were afraid to disagree with students for fear of losing rapport.
1	Loss of day to day continuity for some classes.
1	No disadvantages.
1	Small schools have too many one section classes to be able to schedule effectively.
1	7th and 8th graders being scheduled the same as 11th and 12th grade students didn't work.

What were the most important changes or adjustments made in your FMS program AFTER its adoption?

TABLE 25

MAJOR ADJUSTMENTS OR CHANGES THAT WERE MADE BY THE 33 PUBLIC HIGH SCHOOLS UTILIZING FMS

No. of Schools Making Response	Response
24	A "general tightening up" of student schedules: (a) Students were scheduled to more class time. (b) Students were reduced on lounge time. (c) Some students were entirely structured.
5	Improved the accountability of students through attendance procedures.
5	Dropped most of the large group instructional phase of the program.

TABLE 25-Continued

No. of Schools Making Response	Response
4	Kept some flexibility in some classes but added class time.
4	Added more courses and required 5 or 6 subjects a year for graduation.
4	Modified many classes so that all did not use the same pattern of Large Group, Small Group, or Independent Study.
3	Required student schedule backs for many students.
3	Added supervision to all areas including lounge, cafeteria, and halls where they had previously been unsupervised.
3	Provided more supervisory help and teacher aides.
2	Let traditional teachers have a traditional schedule.
2	Worked with teachers to help them become better prepared, more flexible, and better able to individualize their courses.
2	Tightened-up schedules for 9th or 10th graders.
2	Stricter guidelines were implemented on the use of all areas.
1	Teachers choose the group size and length of periods.
1	Went to computer scheduling.
1	Provided better educational materials that were better adapted for an FMS program.
1	Worked to improve student attitude.
1	Discontinued honor study halls.
1	Adjusted time for mods to provide more mods.

TABLE 25-Continued

No. of Schools Making Response	Response
1	Hand built schedule rather than computer.
1	Developed study labs that were related to classrooms.
1	Discontinued student lounge.
1	Developed phasing program to help students plan their time.

Analysis of Data

The responses given by both the successful and unsuccessful schools were found to be in close agreement. Both successful and unsuccessful schools listed offering more classes and students being able to take more classes as the major benefit of FMS.

The ability to vary the lengths of a class according to its purpose was high on the list of both groups.

The balance of the statements appeared in different rank order, but were found to be similar on both lists. Seven unsuccessful schools stated simply "no advantages."

Thirteen of the unsuccessful schools indicated that the "more capable and/or motivated students could accomplish more."

The two major disadvantages of FMS were found to be in close agreement whether or not the school was

successful in FMS. Twenty-five of thirty-three successful schools (75.8%) stated that student abuse of independent study time was the major disadvantage of FMS.

Twenty-seven of the thirty-nine unsuccessful schools stating disadvantages (69.2%) listed student unscheduled time as the major disadvantage.

The accountability of students and problems with attendance were high on the list of disadvantages of both the successful and unsuccessful schools.

Discipline problems increased greatly in fifteen of the thirty-nine unsuccessful schools. Only six of thirty-three successful schools stated that discipline had greatly increased.

Nine unsuccessful schools stated that the average or below average student achieved less.

Only four of the successful schools made any mention of lack of adequate funding in any area as a disadvantage. Not one unsuccessful school made any comment on funding. Three unsuccessful schools indicated a need for more staff. Seven unsuccessful schools had problems with teacher use of unscheduled time.

Five unsuccessful schools indicated not having facilities designed for an FMS program as a major disadvantage. In-service training of staff was a major problem for only two unsuccessful and one successful school.

Schools successful in FMS were asked what major adjustments had been made in their FMS program.

Twenty-four of the thirty-three (72.7%) successful schools made similar adjustments in their FMS program. The most pronounced problem or disadvantage of an FMS program stated by both the successful and unsuccessful schools in the study was student unstructured time. It was found that a majority of the successful schools made adjustments or changes to lessen or solve the problem. The major adjustments made by most successful schools was to "tighten" up student schedules. Student schedules were reduced on available lounge time, schedules were partly or entirely structured, and students were scheduled back into classes for more instructional time. Another common modification made by successful schools involved improving the accountability of students. This area was mentioned by both successful and unsuccessful schools as one of the major problem areas.

Summary

The three sections of the questionnaire were found to be closely related and did provide an excellent cross reference of problems, solutions, successes, and failures. Only one or two questions proved of dubious value. In those instances the questions still proved valid for either one group or the other in terms of description but resulted in a lack of valid comparability.

The response to the questionnaire by both successful and unsuccessful schools was unusual in that the entire population responded. Successful and unsuccessful FMS schools in Iowa were able to be generally described.

The conclusions drawn from the data presented and analyzed in this chapter can be found in chapter V.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Description of the Study

The purpose of this study was to examine the varied characteristics of Iowa public high schools that experienced either success or failure with FMS. Specifically, the investigation focused attention on the following questions:

1. To what extent were the facilities housing the program designed for FMS?
2. To what extent and in what manner did the staff receive and continue to have in-service training on FMS?
3. To what extent was the community, other than the Board of Education, involved in the examination of FMS prior to its adoption in the system?
4. To what extent were the over-all courses of study modified after the adoption of FMS?
5. To what extent was independent study adopted as part of the FMS program?
6. To what extent did student discipline problems change under FMS?

7. To what extent was the FMS program revised after being formally implemented?
8. To what extent did the evaluation of FMS indicate a change in student achievement?
9. To what extent was the amount and quality of resource materials used in classrooms and resource centers changed with the implementation of FMS?

To obtain data for this study, the author contacted by letter and questionnaire all 450 superintendents of public high schools in the State of Iowa. The 450 superintendents were asked to complete a questionnaire dealing with the high schools' scheduling practices during the 1975-1976 school year. A second question asked whether or not any high schools in that school district had ever utilized any of the various facets of FMS. All 450 school districts responded to that survey.

The schools that had utilized FMS at one time or another constituted the total population to be studied. In order to verify the accuracy of the initial study group, the author obtained FMS school listings from the Iowa Department of Public Instruction; University of Iowa, Iowa City, Iowa; Area 11 Computer Center, Des Moines, Iowa; Westinghouse Learning Corporation, Iowa City, Iowa; and from the author's personal knowledge. These data

were supportive of the information found in the survey response.

The ninety Iowa public high schools which indicated involvement with FMS were again contacted by letter and asked to complete a questionnaire. The questionnaire was composed of three parts: the first section involved descriptive items concerning the school district and its involvement with FMS; the second section involved nine varied characteristics of an FMS program designed specifically for the study; and, the third section involved a short statement response to an open answer question on advantages, disadvantages, and modifications made in FMS programs.

The cover letter was addressed directly to the high school principal and asked that the questionnaire be completed by an administrator, counselor, or teacher who was familiar with that school's FMS program. Responses were received from all ninety schools.

The study sample was further screened through the descriptive questions asked in section one of the questionnaire. On this basis, seventy-nine of the ninety schools met the criteria established for an FMS program. In order to be defined as an FMS school, it must have included variable class times, some facet of large group/small group, laboratories or independent study patterns of instruction, and a daily schedule of more than fourteen modules.

The thirty-three high schools who were continuing to utilize an FMS program during the 1976-1977 school year constituted the successful schools in the study. The forty-six high schools who abandoned FMS, after utilizing it for a year or more, constituted the unsuccessful schools.

The data were divided into two sets of prediction models; one set consisted of the schools that were, during the 1976-1977 school year, utilizing FMS, and, a second set consisted of those schools that no longer utilized FMS. The two sets of data were scored separately on the variables extracted from the questionnaire.

Each question in the study was examined for significance by the percentage of responses to each category given by both the successful and unsuccessful schools in FMS. These data were then commented upon descriptively. When the responses to a question were decidedly different between the two sets of data, it was determined that this category may have been a determining factor of a successful or unsuccessful program in FMS.

Summary of the Findings

The summary and findings of the study have been divided into three sections. Each section includes the findings that were based on the data presented in chapter IV.

Section 1. General Description of the Schools

The successful and unsuccessful schools in the study were found to be well matched in two general areas of description. Both sets of data contained nearly equal percentages of rural and urban schools, and, student enrollment.

The descriptive factors of rural or urban, size of school, the specific facets of FMS adopted, or whether or not the schedule had been computer built were not significantly different between the successful or unsuccessful schools.

There was a direct correlation between the number of graduates going on to two and four year institutions of higher education and the success or failure of FMS in the schools. Schools with over forty-five per cent of their graduates going on to two or four year colleges were far more successful with FMS than schools that had lesser percentages.

Section 2. Responses to Questions Designed for Study

Schools that modified or designed facilities for an FMS program were more successful than schools that did not.

Schools that spent a great deal of time on the in-service training of staff prior to implementing an FMS program were more successful than schools that did not.

The schools that continued to spend at least some time on the in-service training with new staff after implementing a FMS program were more successful than the schools that did not.

The schools that had direct community involvement with lay citizen participation prior to the adoption of FMS in their school system, were far more likely to be successful than the schools that did not involve the public.

A large majority of successful schools made many changes in their educational programs while a large majority of the unsuccessful schools made only a few changes.

Successful schools generally described the independent study facet of FMS as an important or vital part of the program, whereas unsuccessful schools described it as not successful or a complete failure.

A majority of the successful FMS schools experienced decreased discipline problems in classrooms. A four to one ratio existed between the unsuccessful and the successful schools in increased classroom discipline problems.

Discipline problems increased in areas other than the classroom for an overwhelming majority of both successful and unsuccessful schools. However, eight times as many unsuccessful schools reported that discipline problems had increased greatly.

All of the successful schools made at least some modifications in their FMS program after it had been adopted. Schools that made considerable modifications to their FMS programs were not particularly successful or unsuccessful.

Fifty of seventy-nine schools in the study spent some added effort in formally evaluating their FMS program. That factor in itself did not help in distinguishing a successful or unsuccessful school. Student academic achievement was reported higher by a majority of the successful schools compared to only two unsuccessful schools. A large per cent of both successful and unsuccessful schools (36.4% and 45.8% respectively) reported that there was no difference in academic achievement between an FMS program as compared to traditional approaches.

The successful schools spent slightly more than the unsuccessful schools for supplemental resource materials but not to an appreciable degree.

Section 3. Advantages, Disadvantages and Major Adjustments in FMS Programs

Both successful and unsuccessful schools were in close agreement on the advantages and disadvantages of FMS. The major advantages were:

a. The students were offered and were able to take more courses.

b. The length of time provided for each course varied with the needs of that course.

c. The size of the group was varied according to its purpose.

d. The more capable and motivated students were able to accomplish more.

e. FMS brought about a break in teaching technique from a pure textbook approach to a program that placed an emphasis on individual needs through independent study.

A large majority of both successful and unsuccessful schools were in agreement that student misuse of unstructured time was the major disadvantage of FMS. The accountability of students and attendance was also high on the list of disadvantages of both successful and unsuccessful schools.

Unsuccessful schools found discipline problems increased more than the successful schools. Unsuccessful schools reported that academic achievement had declined. Unsuccessful schools also reported that the average and below average students generally accomplished less than they did in a more traditional setting.

The major adjustment that was made by a large majority of successful FMS schools was to reduce the amount of unstructured time available to students. Most successful schools "tightened-up" this facet of the FMS program and improved their attendance procedures.

Limitations of the Study

Before presenting the conclusions that might be suggested by the findings of this investigation, it is necessary to note the limitations of the study.

This study was designed to investigate the varied characteristics of Iowa public high schools that have had success or failure with FMS.

The specific limitations of the study were:

1. The study was limited to those Iowa public high schools that had at one time or another utilized FMS.
2. The study was limited to Iowa public high school administrators, counselors or experienced teachers who were directly involved with FMS.
3. The combination of cells on a Likert Scale can indicate degrees of emphasis of the general characteristics of successful and unsuccessful schools. Schools contemplating an FMS program cannot assume that because one or more of the general characteristics of successful schools are adapted and utilized in their system that the FMS program will meet with success or, if not used, failure.

Conclusions

The findings in this study substantiate the following conclusions:

1. The following descriptive factors were not found to be significant for either successful or unsuccessful schools:
   a. Schools that were rural, urban, or any combination of the two
   b. High school enrollments
   c. The year that FMS was implemented
   d. The adoption of a specific facet of FMS
   e. Whether or not a schedule was computer built
2. Schools that had 45 per cent or more of their high school graduates going on to two or four year colleges were more likely to be successful in an FMS program. Schools that had less than 30 per cent of their high school graduates going on to two or four year colleges were more likely to be unsuccessful.
3. Schools that modified or designed facilities for FMS were more successful than schools that made little or no change in facilities.
4. The schools that spent a great deal of time on in-service training of staff <u>prior</u> to implementing FMS were far more successful than schools that spent little or no time.
5. The schools that continued to spend at least some time on in-service training with new staff members <u>after</u> implementing FMS, were more likely to be successful. Unsuccessful schools spent

little or no time on the in-service training of new staff on the concepts of an FMS program.

6. The extent that the community was involved in the examination of FMS prior to its implementation in the school had a positive relationship to the success of the program.
7. The schools that made many changes in teaching techniques and methodology in the adoption of an FMS program were more likely to be successful. Schools that made few changes in their FMS programs were more likely to be unsuccessful.
8. The schools that described the independent study facet of FMS as a vital or important component were more likely to be successful.
9. FMS schools that experienced decreased discipline problems in classrooms were more likely to be successful while schools that experienced increased discipline problems were more likely to be unsuccessful.
10. Discipline problems outside classrooms increased in most FMS schools whether or not they were successful or unsuccessful. Discipline problems, however, increased to a greater degree in unsuccessful FMS schools.
11. Successful schools generally made some modifications in their FMS programs while unsuccessful schools made little or no modifications. Schools

that made considerable modification to their FMS programs were not particularly successful or unsuccessful.

12. Very few successful or unsuccessful schools put forth a great effort in the evaluation of their FMS programs. However, a significant percentage of both successful and unsuccessful FMS schools made some effort to evaluate their programs.
13. Of those FMS schools that evaluated student academic achievement, it was found that successful schools reported generally higher results while unsuccessful schools reported generally lower results.
14. The dollars spent for improving the quantity and quality of supplemental resource materials were not found to be a distinguishing characteristic between successful and unsuccessful FMS schools. The successful schools spent slightly more than the unsuccessful schools.
15. The major advantages of FMS were common to most schools whether successful or unsuccessful in the program. The major advantages of FMS were:
    a. Students were able to take more classes and/or the school offered more classes.

b. The variable lengths of class modules provided more or less time for classes that had unique needs.

c. The more capable and/or motivated students were able to accomplish more, learn how to handle responsibility, and to be able to work on their own.

d. The new program brought about the demise of the single textbook approach to teaching, and, introduced programs that provided for more individualization with the ability to vary the size of the group according to its purpose.

17. The major disadvantages of FMS were common to both the successful and unsuccessful schools. The major disadvantages of FMS common to most schools in the study were:

a. Most students had difficulty utilizing independent study, free, or unscheduled time in a constructive manner.

b. Attendance problems were magnified. Keeping track of students became more difficult.

c. Certain types of discipline problems frequently increased such as truancy and building vandalism.

18. The major adjustment made in FMS programs by successful schools was to reduce the amount of independent study time. This was generally accomplished by scheduling students to more class time, by completely structuring the problem students, and, by reducing the amount of time students were able to spend in a lounge or commons area.

Recommendations

The findings in this study substantiate the following recommendations:

1. When major changes are to be made, such as FMS, in educational programs, the community should be directly involved. Lay citizen participation on committees that examined FMS programs prior to its adoption aided in its success.
2. High school principals considering a scheduling alternative such as FMS should be aware of the program's total impact on all students and courses. Many FMS schools provided students with large amounts of unstructured time and assumed that all would utilize it properly. Principals are advised that the major problem of FMS was student misuse of independent study time. It is recommended that schools considering adopting an FMS program make adjustments to reduce or eliminate this problem.

3. Academically talented students were more apt to utilize unstructured time wisely than students who were not so inclined or motivated. Principals in schools that generally have 45 per cent or more of their graduates going on to two or four year colleges, should examine FMS as a possible scheduling alternative. However, principals in high schools that typically have fewer than 30 per cent of their graduates going on to two or four year colleges should not generally consider FMS as a viable scheduling and program alternative.
4. It is recommended that principals of schools considering FMS provide their staffs with many training sessions on the various facets of the program and visitations to successful FMS schools. Through extensive examination, the principals and their staffs should become more aware of the advantages, disadvantages, and adjustments needed to make an FMS program succeed in their own unique settings.
5. Principals and their staffs should examine successful FMS programs in similar courses to determine the resource materials needed. They should know that these needs can be met prior to implementation of an FMS program in their schools.
6. It is recommended that each department within the school determine its own best method of teaching students. It is recommended that principals not

schedule all classes into large group/small group, laboratory, and independent study facets of instruction. Each department and courses of study within the curriculum have their own unique needs.

7. Principals in school districts that are considering high school additions or building programs should examine facilities specifically designed for FMS so that the various facets of this program can be considered as a possible educational alternative. Principals and their staffs considering FMS should become fully aware of the facilities that are needed to make the various facets of an FMS program function successfully.
8. Principals in FMS schools must spend some time each year in the in-service training of new staff members to insure the success of the programs.
9. Principals should set guidelines that restrict students in the amount of time spent in a commons or lounge area, particularly if students have large blocks of time available to them. Principals and teachers are to be advised that students, if given a choice, will generally choose to go to a lounge or commons area rather than schedule back to laboratories or classrooms. In that most students will not seek out teachers or schedule back on their own, it is recommended that <u>teachers</u> be required to "schedule

back" students who need guidance and additional assistance.

10. It is recommended that principals require teachers to establish well defined performance objectives for the individualized study facet of a FMS program that will hold both students and teachers regularly accountable for their work. The benefits of individualization did not automatically accrue from free, unstructured, or independent study time.
11. It is recommended that principals require attendance to be taken throughout the school day and that all areas involving clusters of students be supervised.
12. It is recommended that methods of measuring the success or failure of new programs be agreed upon between the board, the administration, the staff and students at the time of adoption. A specific time-table should be set for examining and reporting the results. Semi-annual or annual reports should be made to the board of education and the community on the advantages, disadvantages, and modifications needed or being made in new programs.
13. The community, administrators, teachers and students should make every effort to modify or adjust the various facets of a FMS program that are causing difficulty. FMS programs should not generally be abandoned until efforts have been made to correct the deficiencies.

Recommendations for Further Study

It is recommended that high schools implementing new programs poll their graduates on a regular basis to obtain their opinion as to the strengths and weaknesses of their high school educational programs. Very few schools attempted to determine whether or not the freedom and flexibility of FMS programs helped students better prepare and organize their time after graduation from high school. This facet of the program lacked in reported research and should be studied further.

APPENDIX A

SURVEY LETTER TO SUPERINTENDENTS IN IOWA PUBLIC SCHOOLS

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ADMINISTRATION

ROGER R. OHDE, Supt.
RICHARD E. MOORE, H. S. Prin.
MARVIN W. SKINNER, Elem. Prin.

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JEANNE JOHNSON, Secy.
MARTHA PHILLIPS, Treas.

Bondurant-Farrar Community School

BONDURANT, IOWA 50035

April 21, 1976

Dear Superintendent:

It has been several years since an accurate survey has been compiled concerning scheduling practices utilized in high schools in Iowa. As a secondary principal in the 1960's, I helped to pilot flexible modular scheduling in Iowa. I am now trying to determine the present status of various scheduling practices being utilized in Iowa high schools. From this information, I hope to formulate a hypothesis for a doctoral study. Thank you in advance for providing me with this basic information.

_____ _____
High School Name Address

1. Type of Daily Schedule Utilized in 1975-76.
(Check One That Most Nearly Describes Your High School Schedule)

Traditional

_____ a. 8 period day on a 5 day cycle.

_____ b. 7 period day on a 5 day cycle.

_____ c. 6 period day on a 5 day cycle.

Non-Traditional

_____ d. Flexible Modular Schedule

_____ e. _____Period day on a _____ day cycle.

_____ f. Other - describe:

_____

_____

2. Has your school ever utilized flexible modular scheduling?
Yes _____ No _____

Note: Data is not available from the D.P.I. for past years, and, the data available for this year is incomplete.

Roger Ohde, Superintendent
Bondurant-Farrar Community School
Bondurant, Iowa 50035

APPENDIX B

RESULTS OF AUTHOR'S STATEWIDE SURVEY

A Survey of the Types of Daily Schedules Being Utilized By Iowa Public High Schools During The 1975-76 School Year

May, 1976 by Roger Ohde, Superintendent
Bondurant-Farrar Community Schools, Bondurant, Iowa

	8 PERIOD	7 PERIOD	6 PERIOD	6 to 14 PERIOD ON 6 TO 10 DAY CYCLE	FLEX MOD	OTHER	TRIED BUT DROPPED FMS
Area I	3	14	1	4	4	1	3
II	6	10	2	6	5	0	3
III	7	12	2	3	3	1	6
IV	5	10	0	0	3	1	1
V	19	15	1	7	4	0	9
VI	4	13	0	3	2	0	0
VII	2	20	3	1	2	0	1
IX	9	34	7	9	7	0	11

CONTINUED NEXT PAGE

	8 PERIOD	7 PERIOD	6 PERIOD	6 to 14 PERIOD ON 6 TO 10 DAY CYCLE	FLEX MOD	OTHER	TRIED BUT DROPPED FMS
Area X	3	24	3	9	3	0	3
XI	9	34	7	9	7	0	11
XII	7	21	2	3	1	0	4
XIII	5	25	1	4	1	0	3
XIV	4	15	1	1	1	0	1
XV	1	20	1	3	1	0	1
XVI	2	10	0	1	0	0	0
Totals	81	260	24	57	38	3	52 DROPPED

Total Schools in Survey = 463

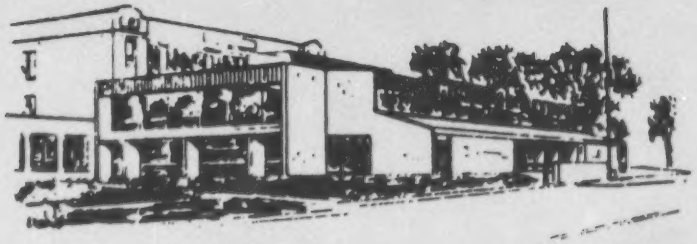
Percentage 17.5% 56.15% 5.2% 12.3% 8.2% .65%

APPENDIX C

LETTER TO SCHOOL PRINCIPALS AND SURVEY QUESTIONNAIRE

ADMINISTRATION

ROGER H. OHDE, Supt.
RICHARD E. MOORE, H. S. Prin.
MARVIN W. SKINNER, Elem. Prin.



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MARTHA PHILLIPS, Treas.

Bondurant-Farrar Community School

BONDURANT, IOWA 50035

January, 1977

Dear _____

Our high school has, since 1971, utilized a flexible modular schedule. This year, our high school staff and administration is undertaking a comprehensive study of various scheduling alternatives. We are doing this prior to making a decision on the type of daily schedule that we will utilize for the next several years.

I have recently completed a statewide survey of the type of daily schedules being utilized in Iowa's public high schools during the 1975-76 school year. A 100% response was received from the superintendents in the state enabling me to obtain a great deal of basic data. I have enclosed the results of that survey on the back of this letter, which I hope you'll share with your superintendent.

One of the most interesting findings of the survey was that ninety schools, had, at one time or another, experimented with some facet of flexible modular scheduling (FMS). However, only thirty-eight schools continued its use into the 1975-76 school year. I am presently doing a doctoral dissertation on a study of the successes and failures of flexible modular scheduling in Iowa. I will be using the results of this study for doctoral research and for helping our school make a decision concerning the future of our FMS program.

If you personally were not in the school system at the time a flexible modular scheduling (FMS) program was in affect at your high school, would you please have this form completed by an administrator, guidance counselor, or experienced teacher who was familiar with the program. If no administrator, counselor or teacher remains in the system at the time FMS was being utilized in your school, state that on the questionnaire and return the forms to me. All ninety schools in the study will be coded so that data within the study will not be identified by school. If you wish to receive a summary of the findings of this study, please indicate that on the last page of the questionnaire.

Once again, I am hopeful for a 100% response from all ninety schools. Thank you very much for your time and effort in helping me complete this study. Should you have any questions concerning this questionnaire, please call me collect at 515-967-2766.

Very sincerely yours,

Roger Ohde, Superintendent

RO:ph

A STUDY OF THE USE OF FLEXIBLE MODULAR SCHEDULING IN IOWA

by Roger R. Ohde

JANUARY, 1977

SCHOOL NAME _____

FORM COMPLETED BY _____

POSITION _____

PART I -

CIRCLE the response that most nearly describes your school.

1. Type of daily schedule being utilized this school year (1976-77) in your high school.

8 period day	7 period day	6 period day	Flexible Modular Schedule (FMS)	Other - identify _____

2. How many years was your school on some type of flexible modular schedule (FMS)?

Information was incorrect. Our school was never on an FMS program.	1 or 2 years	3 or 4 years	5 or 6 years	7 or more years

3. What school year was flexible modular scheduling implemented in your school?

1967 or earlier	1968-69 1969-70	1970-71 1971-72	1972-73 1973-74	1974 or later

4. In the time your school was on an FMS program, how would you describe it?

Went the whole route on all phases of FMG.	Jumped into an FMS program in almost all facets.	Went into several facets of FMS	Went into a few facets of FMS	Made only a few very minor changes from traditional program

5. Rate how successful the FMS program was or is in your school.

Highly successful	Somewhat successful	Not successful or unsuccessful	Not very very successful	Highly unsatisfactory

6. High school enrollment in grades 9 through 12.

Under 200	Between 200 and 500	Between 500 and 1,000	Between 1,000 and 2,000	Over 2,000

7. Describe your school clientele.

All rural	Mostly rural	About half rural and half urban	Mostly urban	All urban

8. What percentage of your high school graduates generally go on to two and/or four year colleges?

0-15%	15-30%	30-45%	45-60%	More than 60%

9. Circle **all** of the areas that your school incorporated into the FMS program. If no responses are circled, it will be assumed that **none** were incorporated into your FMS program.

a. Variable class time.

b. Use of clerical aides

c. Large group/small group instructional patterns in some classes

d. Homeroom mod

e. Independent study phase

f. A student lounge or commons

g. Individual progress system with "packets of learning"

h. A computer built schedule

i. Students were offered more courses and/or the opportunity to take more courses

j. Team teaching

PART II -
CIRCLE the answer that most clearly **describes** or **described** your school's Flexible Modular Scheduling (FMS) program.

10. During the time your school was utilizing an FMS program, were your facilities designed for a flexible modular scheduling program? Examples would include spaces for large group/small group instruction, resource centers for independent study, and, team teaching.

The facility was designed or remodeled to house a total FMS program	Some remodeling or construction of a few new areas were done in the building	Some minor changes were made in the building	Very few changes were made in the building.	No changes were made in bldg. design from a traditional program.

11. How many sessions, consisting of one or more hours (including school visitations as a session), were spent in the in-service training of staff **prior** to adoption?

10 or more sessions	6 to 9 sessions	3 to 5 sessions	1 or 2 sessions	No training sessions were held

12. To what extent was in-service training of new staff members continued **after** the implementation years?

In-service training was given consistantly. All new staff members, year after year received training on the basic elements of FMS.	Some in-service training was given to new staff members on the basic elements of FMS.	Little in-service training was given to new staff members on the basic elements of FMS.	Almost no time was spent on introducing new staff members to the various facets of FMS.	No time was spent in introducing new staff members to FMS.

13. To what extent were members of the community, **other** than the Board of Education, involved in the examination of FMS **prior to its adoption** in your school system?

There was direct community involvement with several community members working on either a steering committee or on an advisory basis	There was some community involvement with lay citizen participation.	Community informational meetings were held.	There was some involvement, but mostly on informational basis with the Board being the only direct lay citizen involvement.	There was no involvement what-so-ever by the community.

14. To what extent were teaching techniques and methodology "modified" after your school adopted an FMS program?

A great deal of change occurred in a majority of the classes	Quite a few classes experienced change	Several classes were affected but mostly in time allocation	Very few classes experienced any change.	No change occurred in technique or methodology in any classes.

15. How would you describe the independent study phase of FMS as it was utilized in your school system?

A very vital part	An important component	No different from our traditional schedule	Not too successful	A complete failure.

16. Discipline.

a. To what extent did student discipline problems change in **classrooms** during the first one or two years of the FMS program?

Increased greatly	Increased somewhat	No change	Decreased somewhat	Decreased greatly

b. To what extent did student discipline problems change in areas **other** than the classroom during the first one or two years of the FMS program?

Increased greatly	Increased somewhat	No change	Decreased somewhat	Decreased greatly

17. To what extent did your school **modify** various facets of the FMS program **after** it was adopted?

Abandoned FMS completely	Considerable modification	Some modification.	Little modification.	No modification.

18. When your school **adopted** an FMS program, did the expenditures made for "supplemental resource materials" **change**?

More than doubled	Nearly doubled	Very little increase	No change.	Decreased expenditures.

19. Did your school formally evaluate FMS in terms of student achievement?

Yes. A great deal of time and effort was spent in evaluating student achievement.	Some additional effort was spent in evaluating student achievement.	A little additional effort was spent in evaluating student achievement	No change was made in any evaluation procedures.	Did not evaluate FMS in terms of student achievement.

20. (Answer this question only if your school evaluated FMS in terms of student academic achievement.)

What were the results of any of the comparison studies that were made on student academic achievement?

FMS results were considerably higher.	FMS results were slightly higher.	No difference	FMS results were slightly lower	FMS results were considerably lower.

PART III -

Answer with brief statements.

21. What were the major advantages of your FMS program?

a.

b.

c.

22. What were the major disadvantages of your FMS program?

a.

b.

c.

23. (Answer only if your school is still on an FMS program)

What were the most important changes or adjustments made in your FMS program **after** its adoption?

a.

b.

24. Do you wish to receive a summary of the results of this study? Yes - No

Do you wish to keep the data on your school non-identified? Yes - No

---

Return the completed questionnaire in the envelope provided.

Thank you for your help in this study.

Royer Ohde, Supt.
Bondurant - Farrar Community School
Bondurant, Iowa 50035

Your promptness will be appreciated.

APPENDIX D

A LISTING OF ALL SCHOOLS IN THE STUDY

INITIAL LIST OF ALL PUBLIC HIGH SCHOOLS IN IOWA
WHO HAVE, AT ONE TIME OR ANOTHER, UTILIZED FMS

Public High Schools in the Study:

High School	Dropped or In FMS
AREA I	
1. Allamakee (Waukon)	Dropped
2. Central Clayborn (Elkader)	Dropped
3. Fayette	FMS
4. Mar-Mac	Dropped
5. North Fayette Community	FMS
6. South Winneshiek	FMS
7. Starmont	FMS
AREA II	
8. Corwith-Wesley	FMS
9. Garner-Hayfield	FMS
10. Kanawha	Dropped
11. Klemme	FMS
12. Lake Mills	Dropped
13. Mason City	FMS
14. Osage	Dropped
15. Rudd-Rockford-Marble Rock	Dropped
16. St. Ansgar-Grafton	Dropped
17. Sheffield-Chapin	FMS
18. Ventura	Dropped
19. Woden-Crystal Lake	Dropped
AREA III	
20. Algona	FMS
21. Estherville	Dropped
22. Lincoln Central	FMS
23. Swea City	Dropped
24. West Bend	FMS
AREA IV	
25. Central Lyon	FMS
26. Floyd Valley	Dropped
27. Maurice-Orange City	FMS
28. Sheldon	FMS

High School		Dropped or In FMS
AREA V		
29.	Cedar Valley-Somers	Dropped
30.	Dows	Dropped
31.	East Greene (Grand Junction)	Dropped
32.	Fonda	Dropped
33.	Gilman City-Bradgate	Dropped
34.	Lake City	Dropped
35.	Lake View-Auburn	Dropped
36.	Northeast Hamilton	FMS
37.	Odebolt-Arthur	Dropped
38.	South Hamilton	Dropped
39.	Webster City	FMS
AREA VI		
40.	Grinnell-Newburg	FMS
41.	Radcliffe	FMS
AREA VII		
42.	Dike	FMS
43.	Grundy Center	FMS
AREA IX		
44.	Pleasant Valley	FMS
AREA X		
45.	College (Prairie)	FMS
46.	Linn Mar	FMS
47.	Monticello	Dropped
48.	Springville	Dropped
49.	West Branch	Dropped
AREA XI		
50.	Adair-Casey	Dropped
51.	Ankeny	Dropped
52.	Ballard	Dropped
53.	Bondurant-Farrar	FMS
54.	Boone	Dropped
55.	Carlisle	FMS
56.	Glidden-Ralston	FMS
57.	Indianola	FMS
58.	Martinsdale-St. Mary's	Dropped
59.	Nevada	FMS

High School	Dropped or In FMS
AREA XI-Continued	
60. North Polk	Dropped
61. Ogden	FMS
62. Perry	Dropped
63. Prairie City	Dropped
64. Southeast Polk	Dropped
65. Urbandale	Dropped
66. Winterset	Dropped
67. Woodward-Granger	Dropped
AREA XII	
68. Cherokee	FMS
69. Eastwood-Correctionville	Dropped
70. Manilla	FMS
71. Schleswig	Dropped
AREA XIII	
72. Clarinda	FMS
73. Fremont Mills	Dropped
74. Irwin	Dropped
75. Lewis Central	Dropped
AREA XIV	
76. Diagonal	Dropped
77. Mount Ayr	Dropped
AREA XV	
78. Oskaloosa	Dropped
79. Wayne	FMS
AREA XVI	
No one ever on FMS	

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